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FARMS ARE GROWING LARGER

Some relationships to

- Individual farm planning
- Community development
- National farm policies

By M. L. Mosher

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FARMS ARE GROWING LARGER

By M. L. MOSHER, Professor of Farm Management, Emeritus

IN ILLINOIS AND IN THE UNITED STATES as a whole, the average size of farm has been rising steadily. It is reasonable to assume that this trend will continue, though how long no one can, of course, say. It is hoped that the material presented in this bulletin will point out some implications of this change and stimulate the thinking of those responsible for farm and home planning, for community development, and for national policies on the subject.

This study had two major objectives: to show how farms of different sizes differ in the efficiency with which they use land, labor, capital, and management; and to study the relation of size of farm to family, community, and national welfare now and in the future. The report is divided into three parts. In the first part, the relationship of size of farm to the efficiency of individual farms is discussed, largely in terms of 1954 data; in the second part eight hypothetical counties, each made up entirely of farms of one size, ranging from small farms to very large ones, are compared in various ways; in the third part, the author's opinions are given of some implications of the growth in size of farm.

BASIS FOR THE STUDY

Farm records. Records kept in 1954 by farmers living in the northern half of Illinois and cooperating with the Illinois Station were the major basis for the study. The results of the study of these records were compared with the results from similar studies in previous years.

Four hundred records of Farm Bureau Farm Management Service farms for 1954 were used (Figure 1 and Table 1). In 1954 feed-cattle and feed-hog ratios were about normal. For farms of less than 100 acres, earnings were below normal because returns from dairy herds and poultry, which were common on small farms, were relatively low. Data from *Illinois Farm Economics* (January, 1956) show that returns for \$100 worth of feed fed to livestock for 1954 and for a longer period were as follows:

	1954	22-year period (1933-1954)
Feeder cattle.	\$126	\$124
Hogs	154	148
Dairy-cow herds	141	171
Poultry	104	163

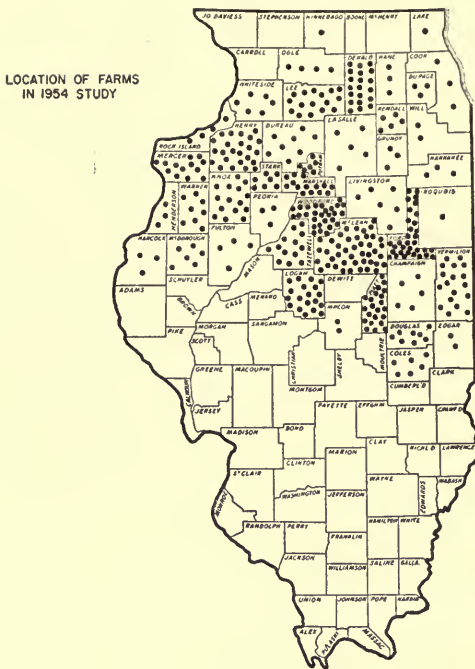
Table 1. — Basic Information Regarding Earnings on Farms of Different Sizes (Northern Illinois, 1954)

	Size-groups of farms — total acres per farm							
	50 to 99	100 to 179	180 to 259	260 to 339	340 to 419	420 to 499	500 to 579	580 or more
Number of farms in sample.....	50	50	50	50	50	50	50	50
Average size of farms, acres.....	81	152	221	295	374	453	539	701
Average percent tillable.....	88	90	91	91	89	88	87	89
Average soil rating.....	78	81	81	81	80	80	80	79
Men per farm.....	1.1	1.3	1.4	1.7	2.1	2.4	2.5	3.2
Total investment per farm.....	\$41,146	\$72,553	\$101,481	\$130,839	\$167,959	\$194,920	\$230,567	\$293,139
Investment per man.....	37,405	55,810	72,486	76,964	79,980	81,216	92,227	91,606
Investment per acre.....	507	478	459	443	449	430	427	418
Farm returns								
Crop sales above feed purchases.....	\$ 2,899	\$ 3,352	\$ 6,608	\$ 8,492	\$ 8,492	\$11,964	\$ 17,328	\$ 21,064
Hog returns.....	2,841	8,170	12,380	13,675	13,675	12,402	11,338	13,747
Dairy sales.....	1,791	1,471	1,015	1,015	1,015	1,015	919	356
Cattle returns.....	1,336	1,437	4,901	4,135	7,307	11,766	9,250	16,425
Sheep returns.....	1,345	1,077	80	4,110	553	519	258	243
Poultry returns.....	1,445	594	859	575	335	577	258	174
Miscellaneous.....	1,361	314	435	604	681	832	1,183	1,250
Gross farm returns.....	\$ 7,819	\$13,030	\$ 18,852	\$ 25,340	\$ 31,843	\$ 38,355	\$ 40,529	\$ 53,268
Farm operating costs								
Feed cost above crop sales.....	\$ 439							
Soil fertility.....	337	\$ 617	\$ 1,060	\$ 1,286	\$ 1,781	\$ 2,513	\$ 2,459	\$ 3,550
Buildings and fences.....	722	1,271	1,271	1,359	1,955	2,239	2,562	2,862
Machinery and equipment.....	2,344	4,077	4,077	6,448	6,448	7,220	7,731	10,144
Labor, paid and unpaid.....	2,253	2,927	2,927	3,785	4,777	5,620	5,888	7,385
Taxes (not income tax).....	423	696	908	1,249	1,465	1,749	1,998	2,760
Seed and crop expense.....	222	445	692	775	1,020	1,261	1,379	1,685
Miscellaneous.....	345	431	431	593	799	819	874	795
Total operating costs.....	\$ 7,085	\$ 8,999	\$ 11,366	\$ 13,873	\$ 18,245	\$ 21,421	\$ 22,891	\$ 29,181
Returns for capital and management	\$ 734	\$ 4,031	\$ 7,486	\$ 11,467	\$ 13,598	\$ 16,914	\$ 17,638	\$ 24,087
Labor costs								
Hired labor.....	\$ 138	\$ 440	\$ 722	\$ 1,408	\$ 2,206	\$ 2,968	\$ 3,067	\$ 4,319
Unpaid family labor.....	214	345	252	304	260	218	277	204
Operator's labor.....	1,911	1,967	1,633	2,073	2,501	2,634	2,044	2,072
Total labor cost.....	\$ 2,263	\$ 2,752	\$ 2,927	\$ 3,785	\$ 4,777	\$ 5,620	\$ 5,888	\$ 7,385
Interest on capital.....	1,822	3,169	4,406	5,659	7,292	8,437	9,955	12,642
Charge for management (7 percent of gross farm returns).....	547	912	1,320	1,774	2,229	2,683	2,837	3,729

Table 1. — Concluded

Item	Size-groups of farms — total acres per farm									
	50 to 99	100 to 179	180 to 259	260 to 339	340 to 419	420 to 499	500 to 579	580 or more		
Returns for labor, capital, and management*	\$ 2,987	\$ 6,783	\$ 10,426	\$ 15,252	\$ 18,375	\$ 22,534	\$ 23,526	\$ 31,472		
Returns for labor ^b	618	2,702	4,700	7,819	8,854	11,414	10,734	15,101		
Labor returns per man	389	2,702	3,257	4,600	4,216	4,756	4,794	4,720		
Farm and family earnings ^c	2,859	6,319	9,704	12,844	16,169	19,566	20,459	27,153		
Operator's labor and management earnings ^d	823	2,859	5,046	7,881	8,367	10,511	9,727	13,517		
Management returns ^e	-1,088	802	3,093	5,908	6,306	8,477	7,683	11,445		
Returns for capital and management ^f	1,734	4,082	7,486	11,467	13,598	16,914	17,638	24,087		
Net earnings per \$100 investment (rate earned) ^g	1.78	5.54	7.39	8.76	8.10	8.68	8.65	8.22		
Net earnings per acre ^h	9.08	26.47	33.89	38.82	36.39	37.31	32.73	34.36		
Some efficiency factors										
Yield of corn, bushels per acre	77.8	72.9	72.4	73.4	74.1	71.1	67.7	71.3		
Bushels of corn per tillable acre	31.5	31.6	29.6	31.8	30.6	30.7	29.0	29.4		
Returns per \$100 fed to hogs	\$ 134.	\$ 153.	\$ 148.	\$ 147.	\$ 157.	\$ 151.	\$ 153.	\$ 141.		
Pigs weaned per litter	6.0	6.9	6.8	7.1	7.2	7.3	7.2	6.8		
Pounds of hogs per tillable acre	219	238	219	242	215	161	124	120		
Milk produced per cow	9,113	7,553	7,724	7,040	7,170	6,889	7,284	6,090		
Eggs produced per hen	205	197	180	183	155	182	165	159		
Labor cost per crop acre	\$ 38.20	\$ 23.67	\$ 17.21	\$ 16.64	\$ 16.98	\$ 15.97	\$ 14.63	\$ 14.03		
Machinery cost per crop acre	\$ 39.76	\$ 26.94	\$ 24.07	\$ 21.22	\$ 22.92	\$ 20.52	\$ 19.22	\$ 19.28		
Buildings and fences cost per acre	\$ 8.90	\$ 6.11	\$ 5.73	\$ 4.60	\$ 5.23	\$ 4.94	\$ 4.75	\$ 4.08		

* Returns for capital and management plus total labor cost.
 b Returns for labor, capital, and management less interest on capital and charge for management.
 c Returns for unpaid labor, capital, and management.
 d Returns for labor, capital, and management less hired and family labor and interest on investment.
 e Operator's labor and management earnings less operator's labor.
 f Returns for labor, capital, and management less total labor cost.
 g Refers to returns to capital and management.



(FIGURE 1)

The 400 records included 50 in each of eight size-groups, beginning with farms of less than 100 acres and increasing at 80-acre intervals to the large-farm group of 580 acres or more. These farms were matched for location by selecting one for each size-group from the same or adjoining counties. They were matched for quality of land by selecting for comparable inherent soil productivity and for equal proportion of tillable land (Table 1). Except for the two groups of the smallest and the largest farms, the farms were quite evenly distributed over 43 counties, all six groups centering in Woodford county. To get 50 usable records of farms under 100 acres, however, it was necessary to use all available records, more of which were from the dairy area of northeastern Illinois than from other areas. To get 50 usable records of large farms, it was necessary to select a few more from the cash-grain area of east-central Illinois than from the other areas.

For purposes of comparison, earlier studies were used. One was for the years 1929 to 1931, based on records kept during the depression years in Livingston, McLean, Tazewell, and Woodford counties. It

included four size-groups — farms of less than 180 acres, 180 to 259 acres, 260 to 339 acres, and 340 acres or more. Another study of records kept from 1940 to 1942 in north-central Illinois included some small and some large farms, but they were not divided into size-groups at equal intervals.

Another study was based on records kept from 1936 to 1945 on farms in north-central Illinois; it used the same size-groups as were used in the 1929-1931 study. Studies for the years 1945-1947 in east-central Illinois and for 1946-1948 in west-central Illinois included farms in five size-groups: under 180 acres, 180 to 259, 260 to 339, 340 to 419, and 420 or more.

In addition, use was made of records kept by cooperating farmers in Woodford county since 1916. Census data were also used.

County-equivalent areas. To show more strikingly some differences related to community conditions between areas of farms of different sizes, hypothetical county-equivalent areas were set up. Eight counties were assumed, in each of which all farms were within one of the size-groups; in one county all farms were between 50 and 99 acres in size, in another, all were from 100 to 179 acres, and so on. The 50-farm sample for each size-group was blown up to give eight hypothetical counties of 20 townships each side by side in northern Illinois. It was assumed that kinds and amounts of products and efficiency of production would remain the same for the farms in each size-group if they were grouped together in one county area.

Assumptions as to families. To make certain comparisons and judgments, it was necessary to choose a standard for the families. It was assumed that 3 children per family, both owner and hired-men families, were brought up.

It was assumed that there was one married hired man for each twelve months of hired labor.

It was further assumed that two children on each farm would marry two children on other farms of the area, so that each couple would inherit amounts equal to two-thirds the value of the farm it occupied and would have to buy the interest of the third child who would move into urban life. Continuity of family operation of farms without off-farm work for father or son requires that the farm provide productive labor for both and income to support the father and mother during the ten to fifteen years before the retirement of the father during which the son must take over if he is to remain on the farm.

Assumptions as to level of earnings. In order to visualize differences in social conditions, seven levels of farm and family earnings were arbitrarily recognized:

1. Hired men — actual average earnings of about \$2,500 a year in 1954.
2. Operators below hired men's earnings — less than \$2,500 a year.
3. Substandard — above \$2,500 and below \$7,000.
4. Standard — \$7,000 to \$11,000. Under conditions in northern Illinois in 1954, \$7,000 was considered the minimum 40-year average income needed to enable a farm-owner family, including three children, to live in a modern home, provide a college education or an equivalent amount of money for business or homemaking for each child, provide for the retirement years of the farmer and his wife, provide for continuity of family ownership and operation, and pay the family's share of the activities of a rural community of similar families.
5. Well-to-do — \$11,000 to \$15,000. This is about 50 percent more than the minimum needed for a good present-day living.
6. Luxury — \$15,000 to \$30,000.
7. Wealthy — more than \$30,000.

In arriving at the "standard" and "well-to-do" earnings, estimates were made of the necessary farm and family earnings for an owner-operator family with three children (Table 2). The first, standard, was for a family on a 160-acre farm with only adequate costs for a good living and sufficient income to cover payments on a \$150-per-acre 34½-year Federal Farm Loan on the 160 acres; to pay annual payments on a \$25,000 ordinary life insurance policy taken out at age 25 to protect the family and safeguard the mortgage; to keep a good residence in good repair; and to pay social security and income taxes. The second, well-to-do, was for maximum necessary living costs and similar items for a similar family on a 320-acre farm. Estimates were also made of adequate and necessary costs for living on tenant-operated farms.

This analysis calls for a two-man farm. Such a farm was assumed for two reasons. First, it was assumed that continuity of ownership and operation of farms within the family from generation to generation is desirable. Such continuity requires that the son or son-in-law take over active participation in the operation of the farm during the 10 to 15 years after he reaches maturity before the father is ready to retire. Second, forty years of farm records in Illinois have shown that more effective use of land, labor, and capital is obtained on two-man farms

Table 2. — Adequate Farm and Family Earnings of Three-Children Families in Northern Illinois and Prospective Retirement Incomes
(Based on 1954 records and costs and spread uniformly over 40 years)

	Owner-operator		Tenant-operator	
	Adequate for good living	Maximum necessary costs	Adequate for good living	Maximum necessary costs
Current living expenses				
Family expenses ^a	\$3,500	\$5,000	\$3,500	\$5,000
College education for 3 children ^b	375	525	375	525
Depreciation on residence ^c	300	500	300	500
Total current expenses.....	(4,175)	(6,025)	(3,875)	(5,525)
Savings				
Social security.....	126	126	126	126
Life insured ^d	290	580	528	1,056
Payments on mortgage ^e	1,296	2,592
Total savings.....	(1,712)	(3,298)	(654)	(1,182)
Living of parents from age 55 to 64 ^f	900	1,325	900	1,325
Estimated income taxes ^g	713	1,352	371	968
Necessary average annual earnings ^b ...	\$7,500	\$12,000	\$5,800	\$9,000
Prospective retirement income of operator				
Income from farm ^h	\$2,560	\$5,120	\$.....	\$.....
Social security.....	1,980	1,980	1,980	1,980
Returns from life insurance ⁱ	233	466	2,880	5,760
Total prospective retirement income...	\$4,773	\$7,566	\$4,860	\$7,740

^a Based on farm-family accounts for 1954 collected by the Department of Home Economics.

^b Based on an estimated annual cost of \$1,250 and \$1,750 per child. It is assumed that any child not attending college would be paid a similar amount to set up in business or homemaking.

^c Based on 2-percent upkeep and depreciation on a \$15,000 or \$25,000 residence.

^d Based on average annual net premiums plus disability waiver for a \$25,000 or \$50,000 ordinary life policy for the owner-operators taken out at age 25 to cover the farm-mortgage loan and for endowment policies for \$40,000 and \$80,000 to mature at age 65 for the tenants.

^e Based on Federal Farm Loans of \$24,000 or \$43,000 to run 3½ years.

^f Figured at \$3,600 and \$5,400 per year for the period while parents are still active and cooperating in the farm business.

^g Estimates based on 20 percent of the necessary average annual earnings after estimated personal, interest, medical, and donation deductions were made.

^h Note that only the \$4,175 for family living expenses, education, and depreciation of residence are for current living costs. The remainder of \$3,325 is for social security, life insurance, payment on the farm mortgage, living of the parents after the son takes over until they retire, and income taxes.

ⁱ Based on a net income of 4 percent on a value of \$400 per acre.

^j Based on dividends on paid-up policies of owner-operators and estimated annuities from endowment policies of tenant-operators.

than on one-man farms, which have high operating costs in proportion to income, or on larger-than-two-man farms where much of the use of valuable machines and the care of crops and livestock and the care of the soil must be left to hired men.¹

The paying for one-third of the value of the farm by each generation is based on the assumption that of the six children on two farms, four will remain on the two farms and inherit two-thirds of the value of the land, while they will have to pay one-third of the value to the children who move away. With inheritance laws and customs as they are in the United States, there is thus a constant movement of capital, as well as of population, from rural to urban areas.

¹ The old-time sayings still hold true that "the eye of the master fattens the flock" and "he who by the plow would thrive must either hold himself or drive."

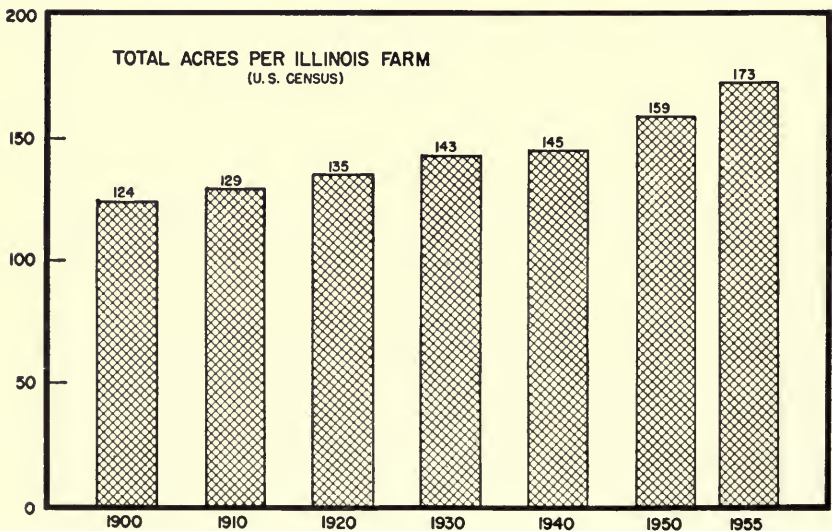
SIZE AND EFFICIENCY OF INDIVIDUAL FARMS

Illinois Farms Are Growing Larger

Illinois farms increased from an average of 124 acres in 1900 to 173 acres in 1955 (Figure 2). The growth, which was gradual at first, has accelerated in recent years. The increase was 11 acres from 1900 to 1920 and 10 acres in the next twenty years; but it was 14 acres from 1940 to 1950 and 14 acres again in the next five years.

The number of Illinois farms decreased from 264,000 in 1900 to 176,000 in 1955 (Table 3). Much of this decrease was due to the combination of small farms into larger farms. Part of it was due to the absorption of farmland by the rapid spreading out of cities, by the development of forest and park areas, by mining operations, and by road building.

During the fifty-five years, the number of farms from 260 to 499 acres increased from 18,000 to 30,000 and the number of farms larger than 500 acres more than doubled (Table 3). Part of this shift to larger farms was due to the increasing use of machines, which are most efficient on large areas, and part to the demands for larger incomes in order to keep pace with a rising level of living. The number of small commercial farms declined greatly, the greatest decline being in those of 50 to 99 acres from 66,000 to 24,000.

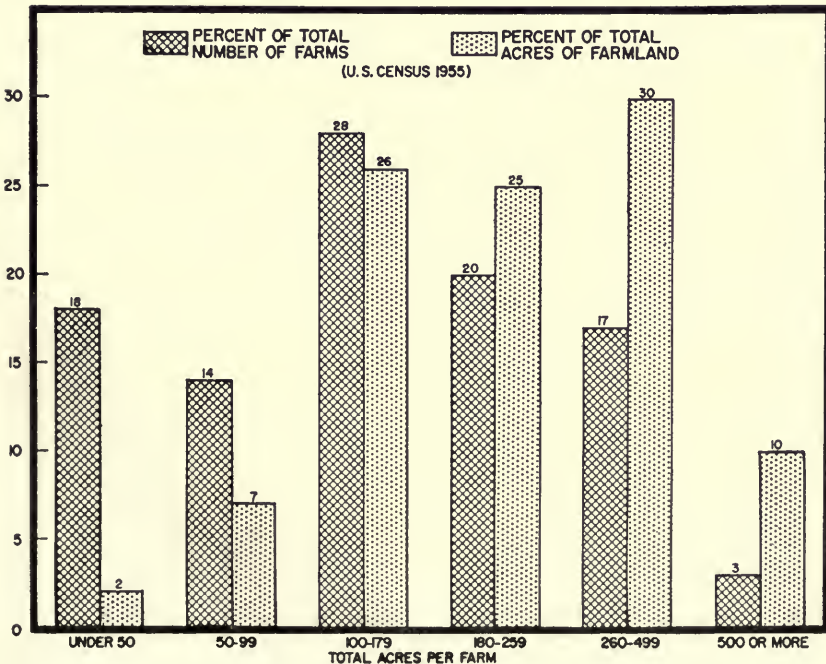


(FIGURE 2)

The number of farms of 180 to 259 acres has not changed much, although the decrease is somewhat greater than the data indicate, as explained in the footnote to Table 3. This is the group that forty years of farm accounting in Illinois have shown to have the greatest efficiency in use of land, labor, and capital. About half of the Illinois farms of more than 50 acres had less than standard farm and family earnings in 1954 (\$7,000 a year). As shown in Figure 10, this level was reached at about 180 acres of good-quality northern Illinois land.

Forty Percent of Illinois Farmland Is in Farms Larger Than 260 Acres

In 1955 farms of 260 or more acres made up one-fifth of the total number of Illinois farms but two-fifths of all the farmland (Figure 3). On the other hand, almost a third of the farms were less than 100 acres but they occupied only 9 percent of the land. Farms of 100 to 259 acres made up almost half the total farms and about half the total acreage.



(FIGURE 3)

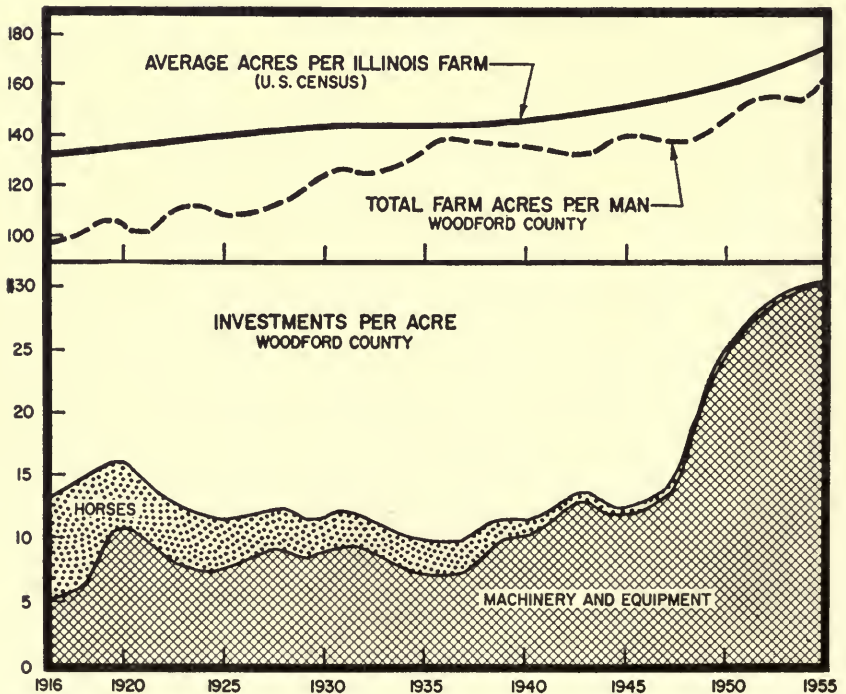
**Table 3.— Number of Farms in Illinois by Size-Groups
(U. S. Census)**

Size-groups	1900	1910	1920	1930	1940	1950	1955
Under 3 acres.....	1,854	845	626	1,054	729	2,662	3,341
From 3 to 9.9 acres.....	7,221	9,191	7,545	8,012	12,009	11,347	7,884
From 10 to 49.9 acres.....	51,720	43,580	35,528	29,427	32,104	27,966	21,883
From 50 to 99.9 acres.....	65,851	57,917	51,920	41,678	38,291	29,088	24,028
From 100 to 179.9 acres ^a	81,338	80,539	81,459	72,347	67,566	56,711	49,266
From 180 to 259.9 acres ^a	35,579	38,315	39,155	38,124	35,614	35,544	34,707
From 260 to 499.9 acres.....	18,255	19,440	19,031	21,604	24,021	27,653	29,504
From 500 to 999.9 acres.....	2,051	1,842	1,733	2,061	2,839	3,889	4,504
1,000 or more acres.....	282	203	184	190	266	408	426
Total number of all farms.....	264,151	251,872	237,181	214,497	213,439	195,268	175,543
Average size of all farms.....	124	129	135	143	145	159	173

^a These size-groups ranged from 100 to 174.9 acres and 175 to 259.9 acres from 1900 to 1930 and from 100 to 179.9 acres and 180 to 259.9 acres from 1940 to 1955. If this adjustment had been made previous to 1940, it would have increased the number of farms in the 180- to 259.9-acre size-group during the first 40 years. This indicates that the decrease in number of farms of 180 to 259.9 acres from 1900 to 1955 was greater than indicated here.

Acres Worked per Man and Power and Machinery Investments Have Risen

The number of acres of farmland worked per man in Woodford county increased from about 100 acres in 1916 to 160 acres in 1955



(FIGURE 4)

(Figure 4). At the same time the average size of Illinois farms went up from 130 to 173 acres.

Investment in power and machinery remained fairly steady after dropping back from its 1920 peak until after World War II, when it rose dramatically. From 1941 to 1955 Woodford county farmers increased their investments in machinery by two and a half times. In 1916 horses made up 60 percent of the total power and machinery investment; in 1955 only a few farms had horses, and these were ponies, riding horses, or old pensioners.

Net Earnings per Acre and per \$100 Invested Were Highest for Farms of 260-339 Acres

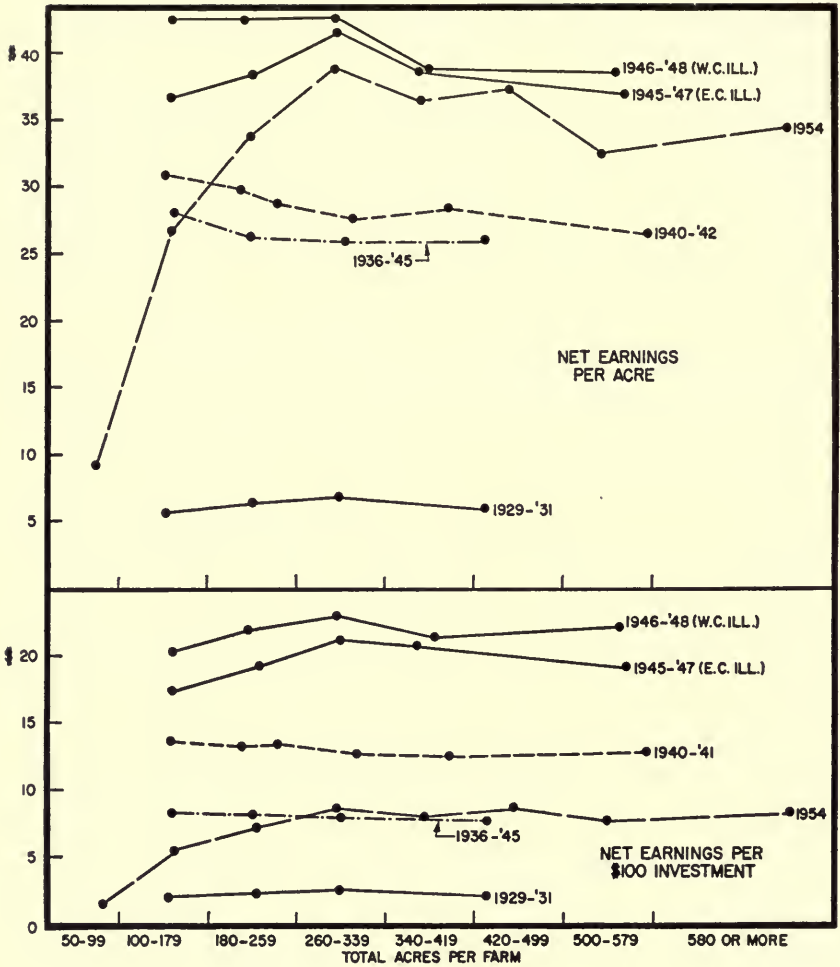
The 1954 data show that net earnings for capital and management per acre of land increased rapidly from the small farms of 50 to 99 acres to the 260-339-acre group, and then gradually declined (Figure 5). Much of the very low net earnings for the two groups of farms under 180 acres was due to the high percent of income from dairy and poultry, which were under a price disadvantage in 1954. On the larger farms, the lower net earnings per acre were due at least in part to their lower corn yields (only a small part of which could be attributed to lower land capability), smaller number of hogs produced, and lower returns for feed fed to all classes of livestock.

Studies made at five other periods (Figure 5) show substantially the same picture, except that the smaller farms were not at as great a price disadvantage as those in the 1954 study. In all six studies the net earnings per acre declined for farms larger than 260-339 acres.

In four of the six studies the highest net earnings per \$100 of capital, including land investments, were for farms of 260 to 339 acres, after which they tended to level off. In two of the studies the highest

Table 4.—Percent of Gross Returns From Different Sources

Item	Size-groups of farms - total acres per farm							
	50 to 99	100 to 179	180 to 259	260 to 339	340 to 419	420 to 499	500 to 579	580 or more
Source of income, as percent of total gross returns								
Sales of feed and grain....	0	22	18	26	27	31	43	39
Meat animals.....	54	60	70	66	67	63	52	57
Dairy products.....	23	11	5	4	2	2	1	1
Poultry and eggs.....	18	5	5	2	2	2	1	1
Total livestock.....	95	76	80	72	71	67	54	59
Miscellaneous.....	5	2	2	2	2	2	3	2



(FIGURE 5)

net earnings per \$100 invested were for farms under 180 acres, with little variation for the higher size-groups.

When a management charge of 7 percent of the gross farm income is taken out, the net earnings per acre and per \$100 of investment follow the same pattern, but at lower levels.

While from 54 to 95 percent of the gross sales from the farms of different sizes was from livestock, from 73 to 86 percent of all gross returns was contributed by crops produced (Tables 4 and 5). The livestock was produced mostly from feed raised on the farms.

Table 5. — Original Sources of Gross Farm Returns, 1954

Item	Size-groups of farms — total acres per farm							
	50 to 99	100 to 179	180 to 259	260 to 339	340 to 419	420 to 499	500 to 579	580 or more
Value of returns								
Feed and grain returns ^a :								
Corn ^b	\$ 3,086	\$ 6,231	\$ 8,459	\$12,114	\$14,592	\$17,348	\$19,558	\$26,219
Other crops.....	2,284	3,902	6,213	7,855	10,679	13,210	14,420	19,585
Total feed and grain....	5,370	10,133	14,672	19,969	25,271	30,558	33,978	45,804
Livestock above feed cost.	1,649	2,583	3,704	4,767	5,891	6,945	5,368	6,205
Miscellaneous.....	360	314	476	604	681	832	1,183	1,259
Total value of returns..	\$ 7,379	\$13,030	\$18,852	\$25,340	\$31,843	\$38,335	\$40,529	\$53,268
Percentage value of gross farm returns								
Feed and grain returns:								
Corn.....	42	48	45	48	46	45	48	49
Other crops.....	31	30	33	31	33	35	36	37
Total feed and grain....	73	78	78	79	79	80	84	86
Livestock above feed cost.	22	20	20	19	19	18	13	12
Miscellaneous.....	5	2	2	2	2	2	3	2
Percentage value of feed and grain returns								
Corn produced.....	58	62	58	61	58	56	57	57
Other crops.....	42	38	42	39	42	44	43	43
Percentage of tillable land								
Corn for grain.....	38	43	40	43	40	42	42	40
Other crops.....	62	57	60	57	60	58	58	60

^a Includes not only the value of crops produced on the farm but also any increase or decrease due to the selling or feeding of feed and grain at prices higher or lower than the first-of-year inventory or purchase price of such feeds.

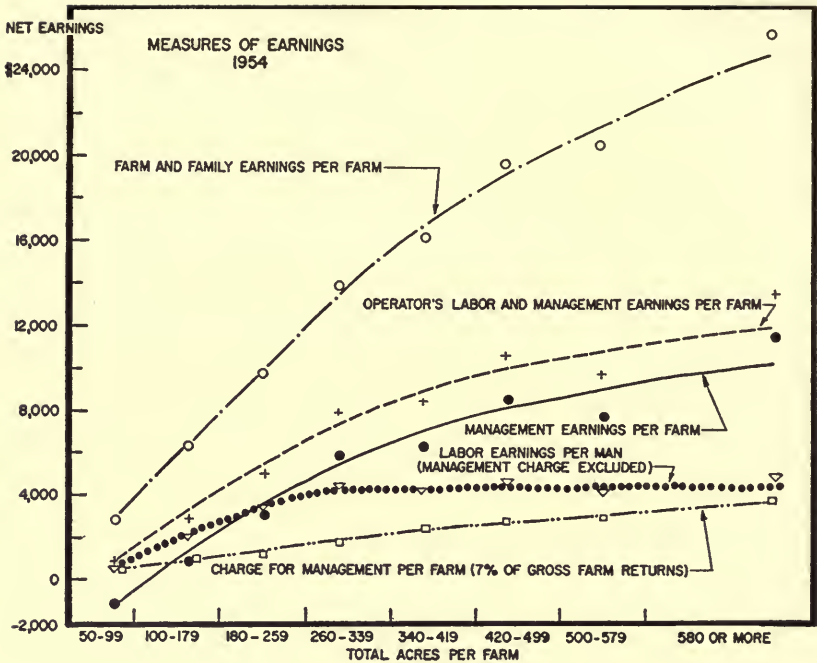
^b Calculated by applying the average price received for corn sold to the total bushels of corn produced.

Earnings per Farm Rose With Size of Farm

As would be expected, farm and family earnings per farm, operator's labor and management earnings, and management earnings per farm all tended to rise for larger farms (Figure 6). Labor earnings per man (management charge excluded), however, leveled off at 260-339 acres.¹

The efficiencies due to larger size of farms appeared to level off at about 260 acres. Unpublished data from an earlier study of 240 north-central Illinois farms for 1936 to 1945 show that those farmers who increased the size of their farms during the period were, as an average, more efficient operators during the first part of the period than were those whose farms remained constant in size, but that they lost some

¹ If instead of being uniform at 7 percent (approximately the amount charged for management by many professional farm managers), the management charge had been graduated with a smaller percentage charge for the larger farms, the trend in labor earnings would have been slightly upward from farms of 260-339 acres.



(FIGURE 6)

of their advantage in efficiency after they increased the size of their farms.

Farm and family earnings consist of the balance between cash receipts and cash expenses, plus or minus inventory change, minus depreciation of capital assets, plus family living obtained from the farm. These earnings are what the owner-operator has with which to pay interest, debts, income tax, savings, and family living. On rented farms they are divided between the landlord and the tenant.

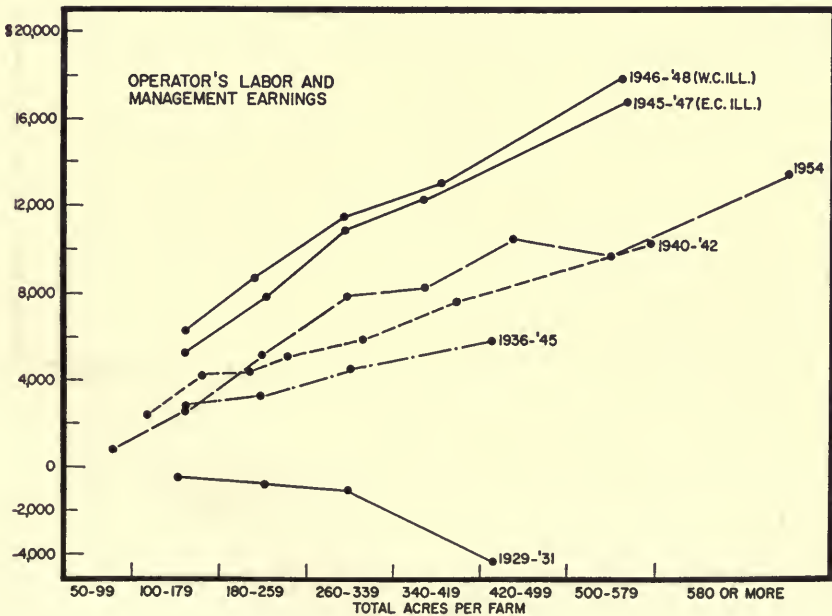
Operator's labor and management earnings consist of the farm and family earnings of the operator minus unpaid family labor and minus 4 percent interest on the market value of the land and 5 percent interest on inventories and capital assets. This is the most common measure of farm earnings that has been used in most states during the past thirty years.

Management earnings per farm consist of the operator's labor and management earnings minus the charge for his labor. A few states have used this measure of farm earnings.

Labor earnings per man are obtained by adding hired labor to the farm and family earnings, then subtracting interest on all investments and a management charge of 7 percent of the gross farm returns, and dividing by the total number of men working. This measure divides net farm earnings equally among all hired, unpaid family, and operator labor after interest on all investments and a management charge are deducted.

Operator's Labor and Management Earnings Rose as Farms Increased in Size

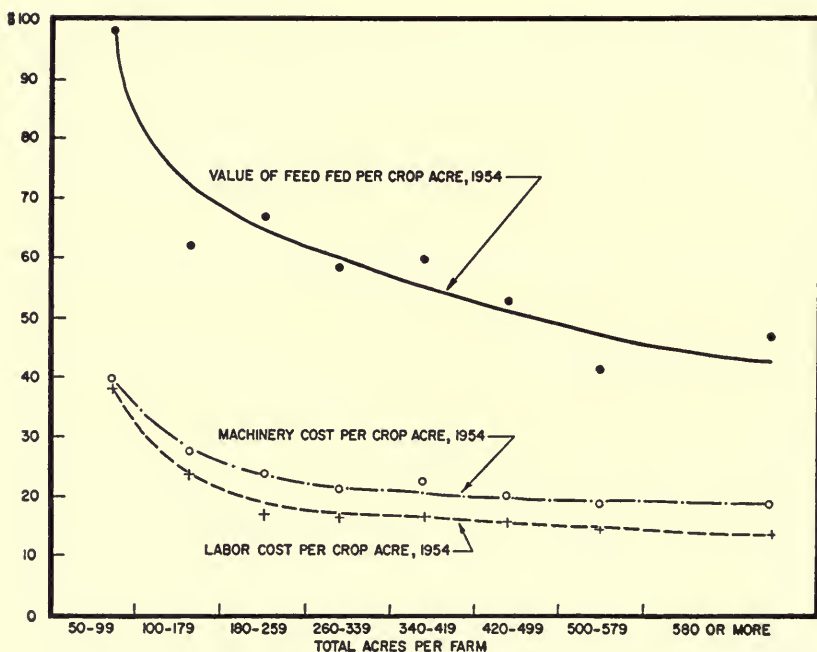
Studies during six different periods (Figure 7) show that labor and management earnings increased as the size of farm increased when net earnings per \$100 invested in land, inventories, and capital assets exceeded the rate of interest charged, and that they decreased when the net earnings were less than the rate charged. In 1929 to 1931 net earnings per \$100 of investment were only 2 to 3 percent, but in all other periods were above 7 percent, except for the small farms in 1954.



(FIGURE 7)

Labor and Machinery Costs Declined With Larger Farms and With Less Feed Fed per Crop Acre

Much of the rapid decline in labor and machinery costs per crop acre from the smallest farms to those of 260 acres and more was due to their more efficient use on the larger farms and to the smaller amounts of livestock, as shown by the feed fed per crop acre (Figure 8). Much of it was due also to the fact that a greater proportion of the livestock on the small farms was dairy cattle and poultry, both of which require much labor and equipment. Both of these costs declined only gradually for farms larger than 260-339 acres.



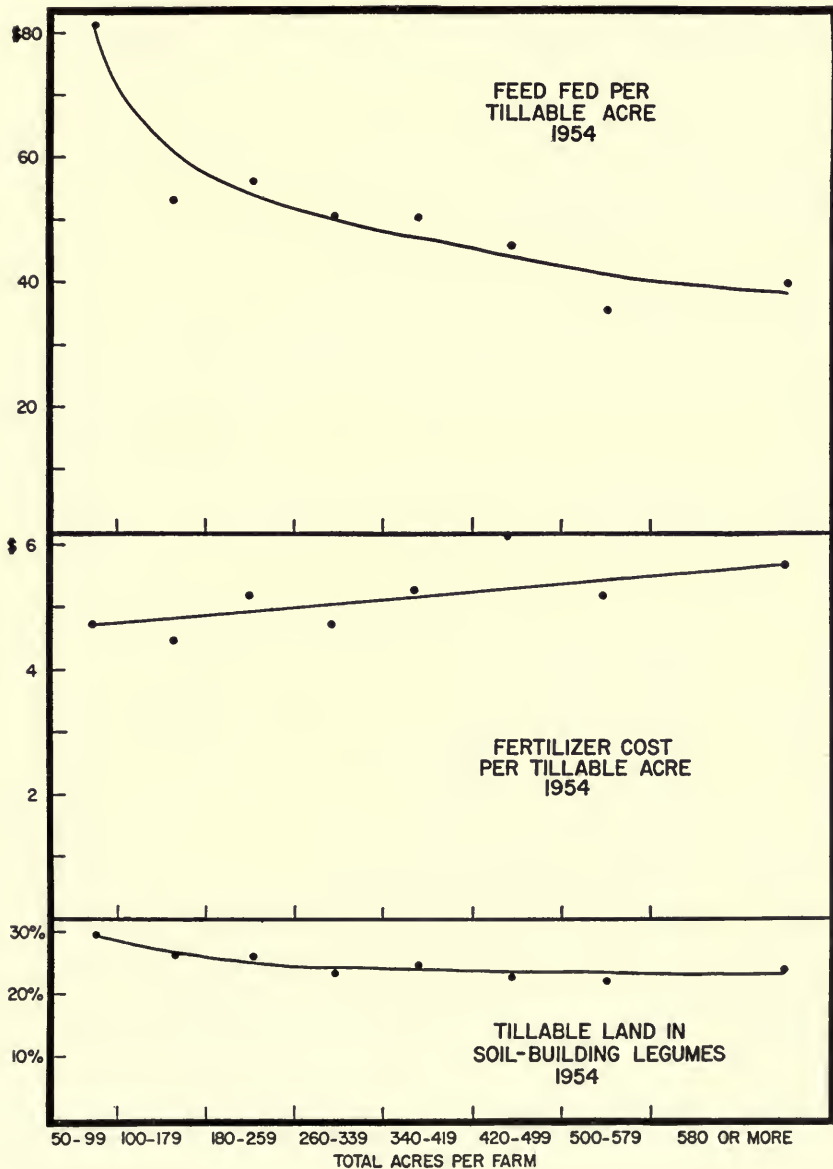
(FIGURE 8)

Smaller Farms Had More Manure and Soil-Building Legumes

The amount of animal manure available per tillable acre, as measured roughly by the value of feed fed per tillable acre, was considerably higher on the smallest farms (Figure 9). The amount declined gradually from farms of 100 to 179 acres to the largest farms.

The percent of tillable land in soil-building legumes was also great-

est in the smallest size-group because the larger amount of livestock, especially dairy cattle, required more hay and pasture, which was mostly legumes. As used here, soil-building legumes included all land



(FIGURE 9)

left for the year in biennial and perennial legumes and land that had a good catch crop of sweet clover or alfalfa plowed down.

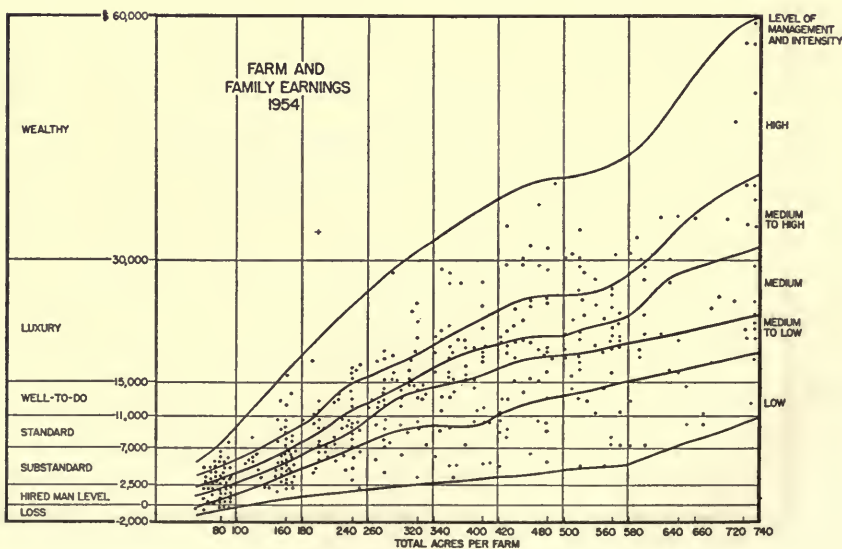
The larger farms used more fertilizer per tillable acre, including limestone and rock phosphate, but not as much animal manure and legumes. A larger proportion of tillable land was in grain and grain silage on the larger farms.

Except for the small farms of 50 to 99 acres, the land use was approximately the same regardless of the size of farms.

Farm and Family Earnings Were Related to Size of Farm and Level of Management

In an area where the quality of land is the same, differences in the amount of farm and family earnings will depend on the size of farm, the quality of management, and the intensity of the business. The differences shown in Figure 10 are due to all three of these factors.

With medium levels of management and intensity, farm and family earnings varied from about \$2,500 for the smallest farms to about \$24,000 for the largest farms. With farms of medium size (260 to 339 acres), farm and family earnings varied from about \$6,000 for a low level of management and intensity to about \$21,000 for a high level. Thus a farm family on a relatively small farm with a low level of

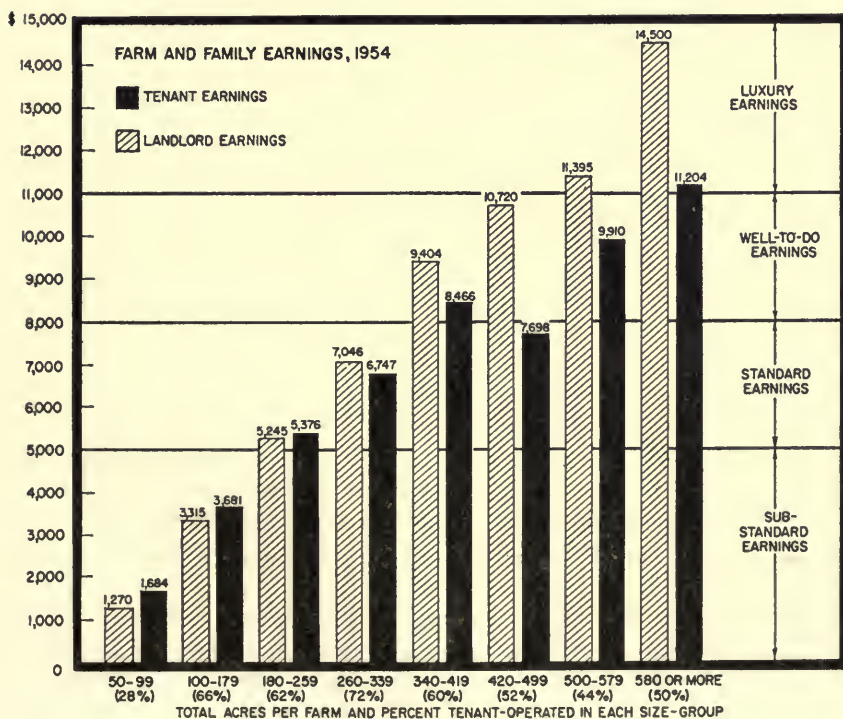


(FIGURE 10)

earnings may be able to increase its earnings to a satisfactory level either by obtaining more land or by raising its level of management or intensity or by doing both. A third way to increase earnings, of course, is to do part-time work off the farm.

An example of what is possible is indicated by the farm represented by a plus sign (+) on Figure 10. This 200-acre farm had farm and family earnings of about \$34,000 in 1954; it is tenant-operated, and the tenant received about \$17,000 as his share. It is on soil rating 95 to 100, 60 percent of which was in corn that made 95 bushels an acre. Much corn in addition to that raised was fed. About 230 litters of pigs weaning more than eight pigs per litter were raised. (Data from this farm were not used in this study because it was so far out of line with other farms in its size-group.)

For explanation of the seven levels of farm and family earnings shown on the chart, see page 8. The level of management and intensity was determined by dividing the farms of each size-group into five equal number-groups according to the total farm and family earnings per farm.



(FIGURE 11)

Landlord Earnings Were More Than Tenant Earnings for Farms Larger Than 260 Acres

When the returns for unpaid labor, capital, and management (called "farm and family earnings" in the previous discussions) were divided between the landlord and the tenant for the farms where all the land was rented, tenants' earnings were found to be more than landlords' earnings on farms of less than 260 acres and less than landlords' earnings on farms of more than 260 acres (Figure 11, page 21).

In comparing levels of earnings, lower levels were assumed for tenants than for owner-operators. "Standard" earnings were assumed to be from \$5,000 to \$8,000; "well-to-do" earnings were set at \$8,000 to \$11,000; and "luxury" earnings at more than \$11,000. On this basis, the average tenant's family earnings were "standard" or better for families operating farms of 260 or more acres. As shown previously, (Figure 10) the average owner-operator's earnings were "standard" or better for farms of 180 acres or more.

COMPARISONS OF COUNTY-EQUIVALENT AREAS OF FARMS OF DIFFERENT SIZES

In this section the 1954 data for each size-of-farm group have been "blown up" into hypothetical counties of twenty townships each, assumed to be corn-belt counties of northern Illinois (Table 6). It is assumed that 5 percent of each county would be occupied by cities, villages, roads, and other nonagricultural uses. In one county all farms are from 50 to 99 acres in size, in another all are from 100 to 179 acres, and so on. It is assumed that kinds and amounts of products and efficiency of production would remain the same as they are now if the farms of a certain size were grouped together in one county area.

A hypothetical county comprised only of farms 50 to 99 acres would contain 5,391 farms averaging 81 acres each, while the same area divided into farms of 580 acres or more would consist of only 624 farms averaging 701 acres each. Nearly 6,000 men would be required to operate the farms in the small-farm county area, while only about 2,000 would be required in the two large-farm areas, on the basis of 1954 data.

Total farm and family earnings per county-equivalent area were lowest in the area of smallest farms and largest in the area of 260-339-acre farms. Earnings were about 4 million dollars more in the 260-339-acre area than in either area of farms larger than 500 acres.

Table 6. — Basic Data Enlarged to Hypothetical County Areas of Farms of Different Sizes

(Based on 1954 records)

	Size of farms in hypothetical county areas, acres							
	50 to 99	100 to 179	180 to 259	260 to 339	340 to 419	420 to 499	500 to 579	580 or more
Average size of farms.....	81	152	221	295	374	453	539	701
Number of farms.....	5,391	2,888	1,978	1,482	1,171	966	812	624
Total number of men ^a	5,930	3,754	2,769	2,519	2,459	2,318	2,030	1,997
Number of farm families ^b	5,669	3,448	2,586	2,343	2,183	2,092	1,792	1,689
Total farm returns in thousands of dollars								
Crop sales less feed costs.. \$.....	\$ 8,372	\$ 6,630	\$ 9,793	\$ 9,944	\$11,557	\$14,070	\$13,144	
Hogs.....	15,316	17,669	16,160	18,347	16,013	11,884	9,206	8,578
Cattle less dairy products..	7,202	4,150	9,694	6,128	8,896	11,366	7,511	10,249
Dairy products.....	9,655	4,248	2,008	1,375	628	555	503	222
Sheep.....	243	569	158	163	383	308	449	152
Poultry.....	7,790	1,715	1,699	852	626	557	209	109
Total livestock.....	\$40,206	\$28,351	\$29,719	\$26,865	\$26,546	\$24,670	\$17,878	\$19,310
Miscellaneous.....	1,946	907	940	895	798	804	961	785
Total farm returns.....	\$42,152	\$37,630	\$37,289	\$37,553	\$37,288	\$37,031	\$32,909	\$33,239
Operating costs in thousands of dollars								
Feed above crop sales..... \$ 2,367	\$.....	\$.....	\$.....	\$.....	\$.....	\$.....	\$.....	\$.....
Soil fertility.....	1,817	1,782	2,097	1,906	2,085	2,427	1,997	2,215
Buildings and fences.....	3,892	2,674	2,514	2,014	2,289	2,163	2,080	1,786
Machinery and equipment	12,637	9,045	8,064	7,152	7,551	6,975	6,278	6,330
Hired labor.....	687	1,272	1,428	2,087	2,583	2,867	2,490	2,830
Taxes (not income tax)....	2,280	2,010	1,795	1,851	1,716	1,690	1,622	1,722
Seed and crop expense.....	1,197	1,285	1,369	1,149	1,194	1,218	1,120	1,051
Miscellaneous.....	1,860	1,302	853	879	936	791	710	496
Total operating cost.....	\$26,737	\$19,370	\$18,120	\$17,038	\$18,354	\$18,131	\$16,297	\$16,430
Farm and family earnings in thousands of dollars.....								
Farm used produce.....	\$15,415	\$18,260	\$19,169	\$20,515	\$18,934	\$18,900	\$16,612	\$16,809
Farm and Family income..	1,100	861	564	403	370	312	257	231
Farm and Family income..	14,315	17,399	18,605	20,112	18,564	18,588	16,355	16,578

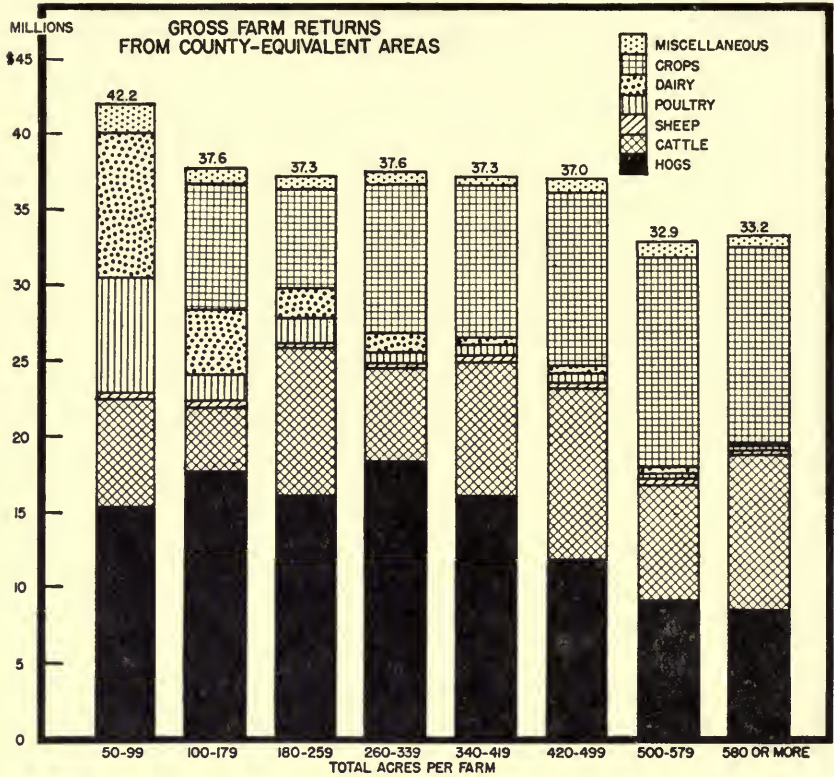
^a Obtained by adding to the number of farm operators (one for each farm) one man for each 12 months of hired and family labor.

^b Includes one farm operator's family (including unpaid family labor) for each farm and one family for each 12 months of hired labor.

Distribution of Gross Farm Earnings

In the county made up of farms of 50 to 99 acres in size, about 42 million dollars worth of products would have been sold in 1954. This is over 5 million dollars more than would have been sold from any of the five counties made up of farms from 100 to 499 acres, and about 9 million dollars more than would have been sold from the two counties of farms larger than 500 acres (Figure 12).

The greater value of sales from the small-farm area is due to the larger production of livestock and livestock products, especially dairy and poultry products. Some of it is due to the production of livestock from feed brought in from other areas. The lower value in the large-farm areas is due in part to lower crop yields and in part to less livestock and lower livestock efficiency.

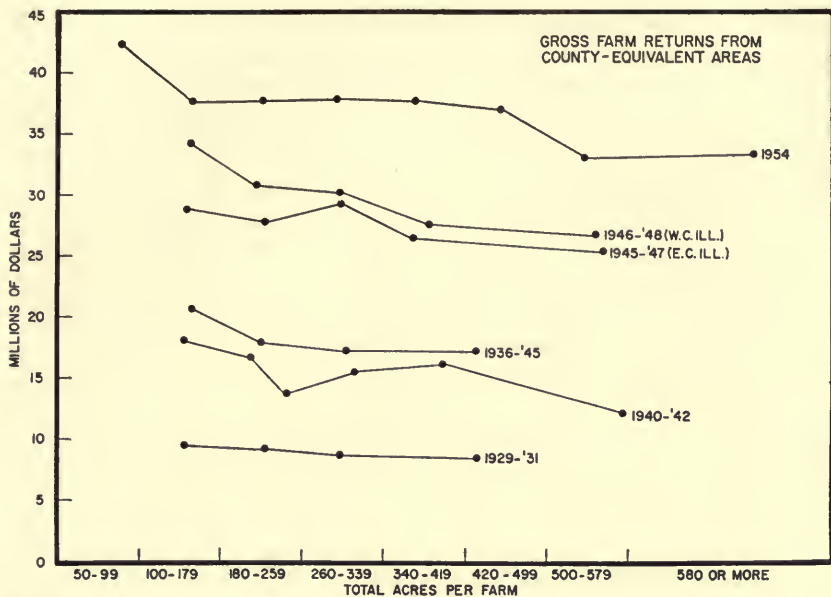


(FIGURE 12)

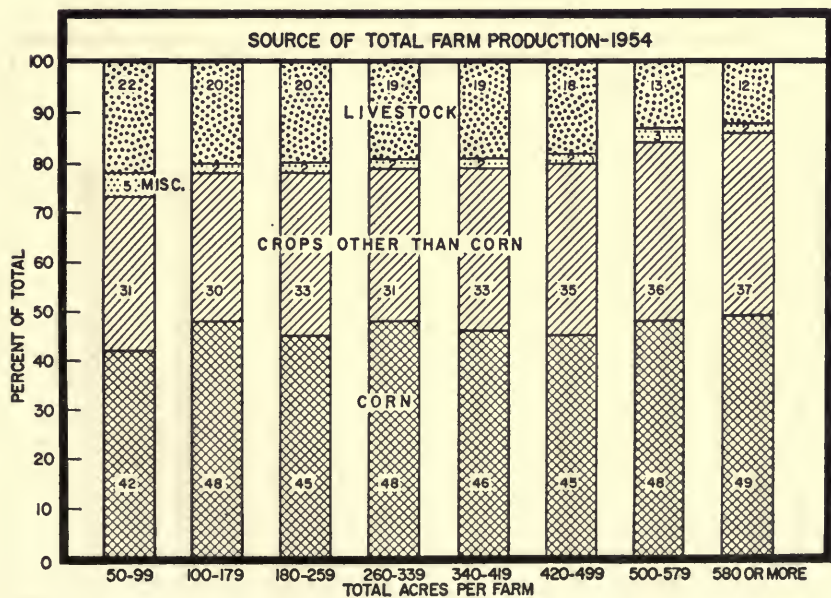
This relationship holds true when data for other periods are translated to county-equivalent areas (Figure 13). Even in the period of deep depression (1929 to 1931), the value of gross farm returns would have been about 1 million dollars more in a small-farm county area than in an area of farms of 340 acres or more. The amount of business originating in an area of small farms is appreciably greater than in an area of similar large farms.

The tendency to intensify the farm business on small farms is shown by the relatively large production of dairy and poultry products in the areas of farms under 180 acres. All four groups of farms larger than 340 acres tended to eliminate dairy and poultry.

The larger farms tend to eliminate high-labor-requiring livestock, as indicated by the relatively small value of hogs produced and small values of dairy and poultry products in the county-equivalent areas of farms larger than 420 acres.



(FIGURE 13)



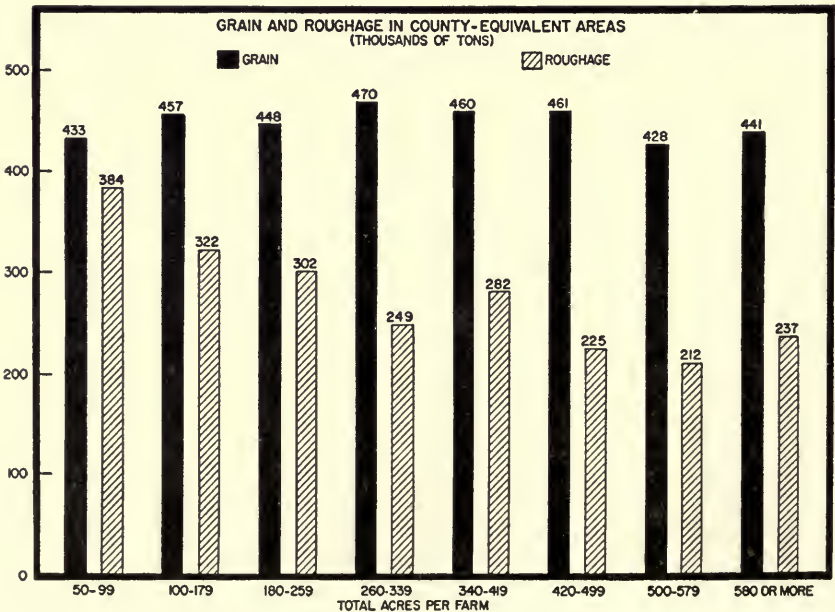
(FIGURE 14)

The fact that the gross farm returns were nearly all from the sale of livestock and products can be misleading if one fails to realize that when a farmer sells livestock, he is indirectly selling the home-grown feed that was fed to the livestock. Analyzing the original sources of the gross farm returns shows that from 73 percent on the smallest farms to 86 percent on the largest originated with the crops produced on the farm during the year (Figure 14). The fact that about 75 percent of the gross farm returns on corn-belt livestock farms on which most of the feed fed is produced on the farms originates with the crops (Table 5) is an important consideration in developing a farm plan.

Approximately 60 percent of the value of all crop returns was derived from corn, which was produced on about 40 percent of the tillable land. The value per acre of the corn crop was about two and one-fourth times that of the other crops. (The value of pasture produced on the small amounts of unillable land was included with the other crops.)

Production of Grain and Roughage

The largest production of corn per tillable acre was in the county area containing farms of 260 to 339 acres. This high production was



(FIGURE 15)

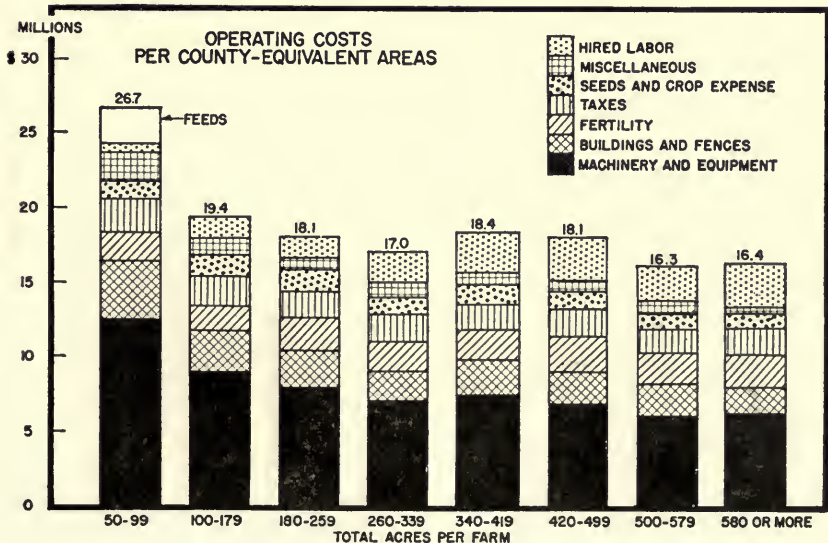
largely responsible for the fact that this area produced the largest tonnage of grain. It also produced the most hogs per tillable acre. The smaller tonnage of grain in the small-farm area was due to the large proportion of the land in hay and pasture. The smaller tonnage in the two large-farm areas was due to lower crop yields.

The largest tonnage of roughage was produced in the small-farm area, which had a larger proportion of land in hay and pasture. The lowest production of roughage was in the three areas of largest farms.

In Figure 15 the total tonnage of grain includes an estimate of the grain in grain silage. A few miscellaneous cultivated crops, such as canning crops, were converted to grain equivalent by using the weight of corn that would have been produced on the same acreage. Roughage included the hay produced plus the hay-equivalent of grass silage and pasture. Grass silage was converted to hay-equivalent by allowing the same weight of hay-equivalent per acre as the yield of hay on the same farm (about three tons of grass silage grew on the same acreage as one ton of hay). Pasture was converted by allowing one ton of hay-equivalent for each 60 pasture-days.

Operating Costs

Total operating costs other than feed costs above crop sales (Figure 16 and Table 6) were 5 to 7 million dollars more for the county made



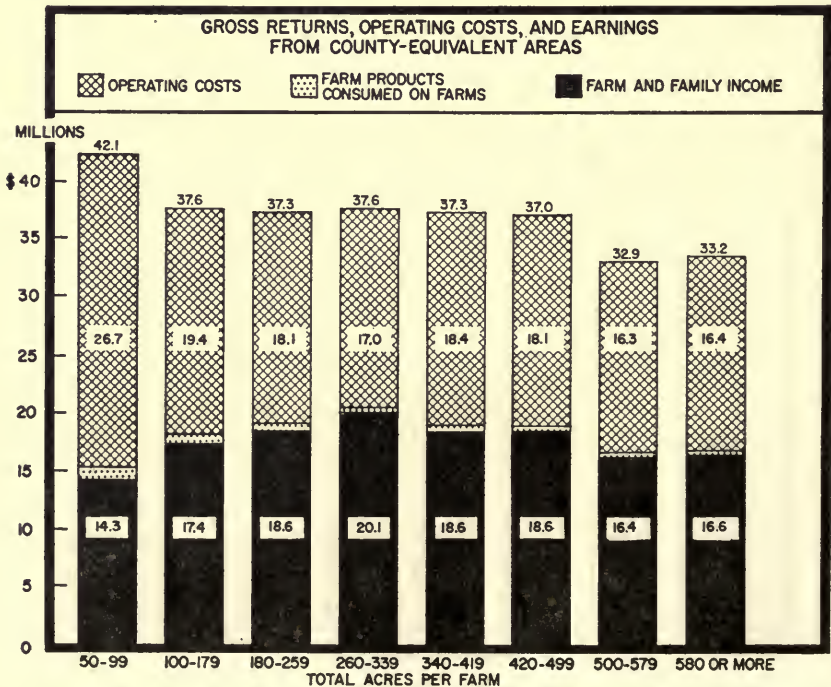
(FIGURE 16)

up of the smallest farms than for the five areas of farms from 100 to 499 acres, and about 8 million dollars more than for the two largest-farm areas. Greater machinery, equipment, building, and fence costs accounted for most of the higher costs. The county area of farms of 180 to 259 acres provided about 2½ million dollars more business annually for suppliers of machinery, equipment, and building and fencing materials than did the county areas of 500 or more acres per farm.

When purchases of feed are added to the other operating costs, an even greater difference is found in the amount of business originating in the different areas, since such purchases were greatest in the smallest areas. Such purchases for the eight areas, from the smallest-farm area to the largest, were 15.3, 9.4, 10.5, 8.5, 8.6, 8.2, 6.2, and 7.4 million dollars. Some of this feed, however, was grain and roughage purchased from neighboring farmers.

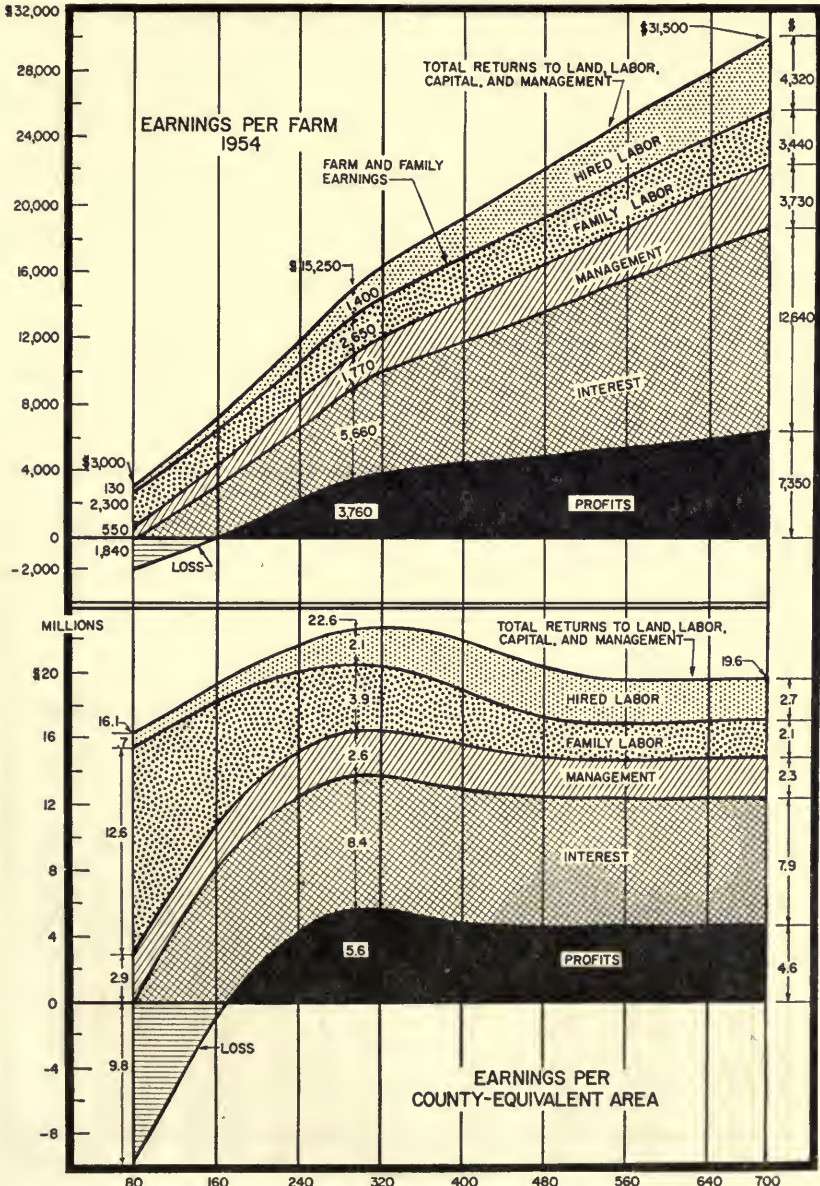
Farm and Family Earnings per County Area

Farm and family earnings per county-equivalent area before income taxes were paid, including the value of farm products consumed on the farm, were about 1½ million dollars higher in the area of farms of 260



(FIGURE 17)

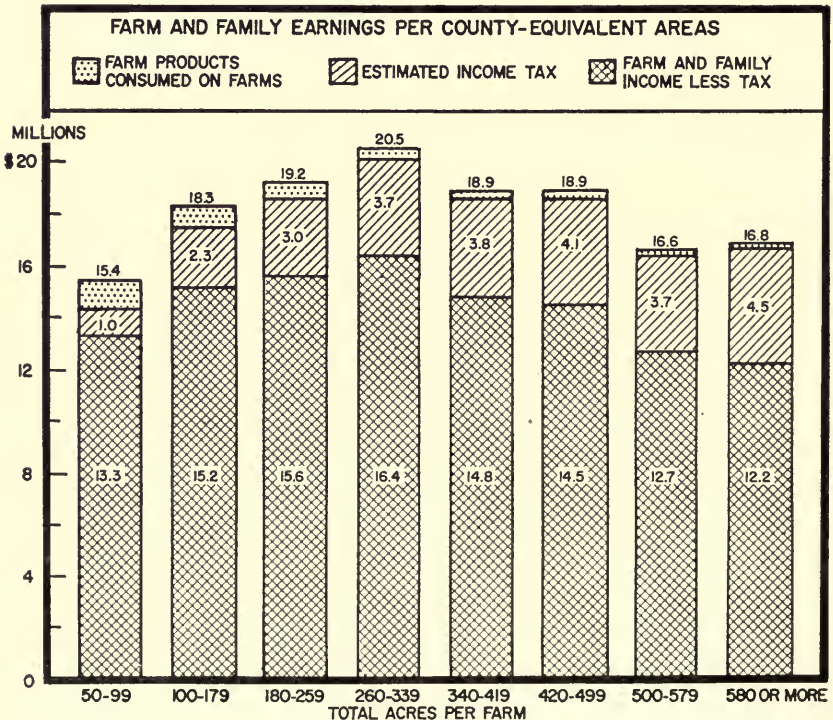
to 339 acres than in any other area (Figures 17, 18, and 19). They were about 6 million dollars more than in the small-farm area and 3 to 4 million dollars more than in the two large-farm areas.



(FIGURE 18)

In the two large-farm areas, farm and family earnings were low because of low gross returns, due to low crop yields and relatively small numbers of livestock, especially hogs. In the area of smallest farms, gross returns were much higher than in other areas, largely because of purchases of feed, but farm and family earnings were much lower because of high operating costs. While the larger numbers of farm families in the small-farm counties consumed more products raised on the farm, the proportion of gross production consumed on the small farms was small.

After estimated income taxes are deducted, farm and family incomes in the area of farms of 260 to 339 acres were about one-third higher (4.2 million dollars more) than in the area of largest farms (Figure 19). In the 50- to 99-acre area, total farm and family earnings before income-tax deductions were well below those in other areas, but after deducting estimated income taxes, incomes were about a million dollars higher in the small-farm area than in the two large-farm areas.



(FIGURE 19)

Numbers of Farm Families With Different Levels of Earnings

The percent of all farm families falling into each of the seven levels of farm and family earnings is shown in Figures 20a and 20b for each of the eight county-equivalent areas. In this chart the width of each column shows the percent of farms in each level-of-earnings class. The height of each column shows the average farm and family earnings for each class.

Definite trends as size of farm increases are evident in Figure 20. The proportion of families of hired men increased from 5 percent of all farm families in the small-farm county to 63 percent in the large-farm county. Only 2 percent of the farm families in the small-farm county (1 farm in the sample of 50) had as much as the standard level of earnings required for a good living, while 31 percent of those in the large-farm area had luxury or wealthy earnings.

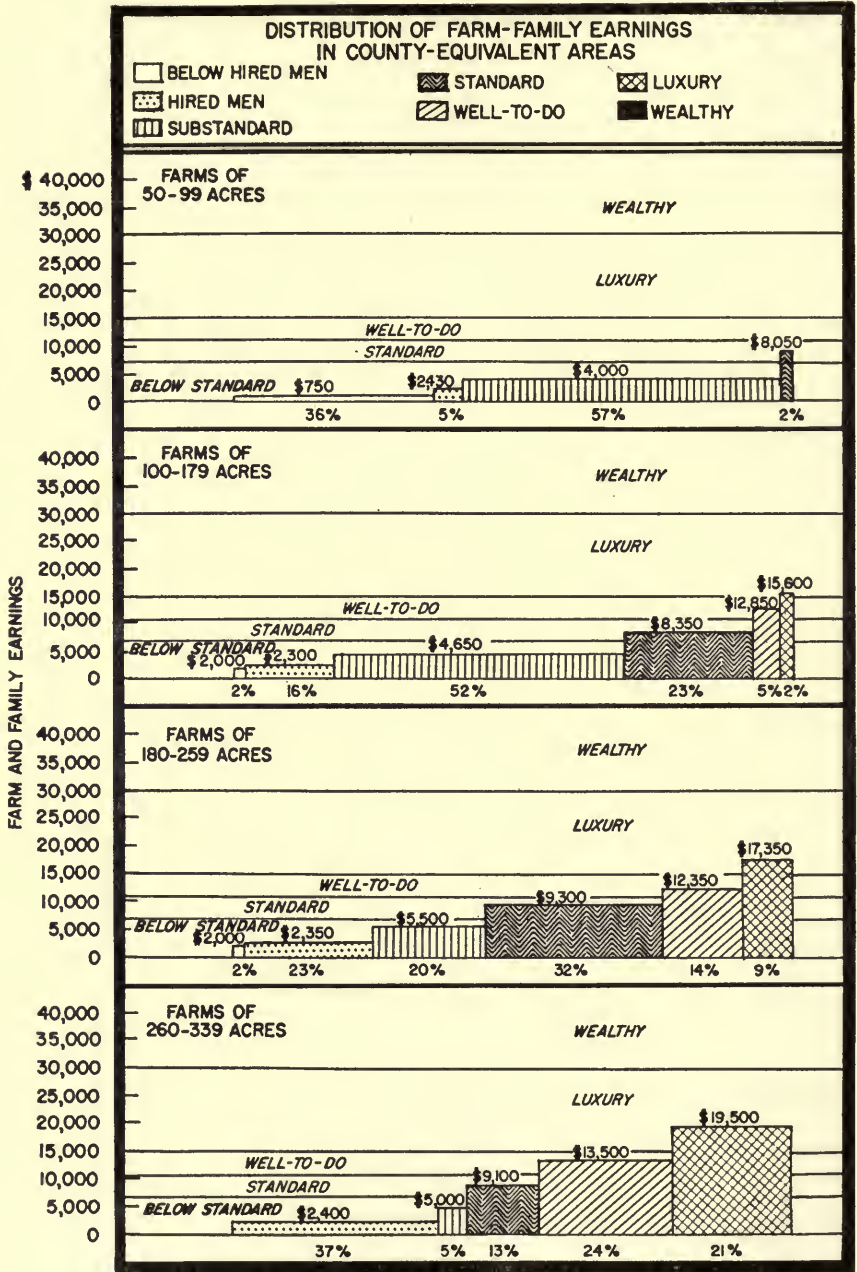
The largest *numbers* of farm families having standard and well-to-do earnings are found in the county-equivalent areas of farms of 100 to 179 acres (982 families) and 180 to 259 acres (1,187 families). The largest *percentages* in these two level-of-earning classes are found in the areas of farms of 180 to 259 acres and of 260 to 339—46 and 37 percent respectively (Table 7 and Figures 20a and 20b).

In the county of farms of 100 to 179 acres, 18 percent of all families had hired men's or below hired men's earnings and 2 percent had luxury earnings. Thus 80 percent of the families in that area were "between poverty and riches." In the county of largest farms, 63 percent were hired men's families and 31 percent had luxury or wealthy earnings. Only 6 percent were "between poverty and riches."

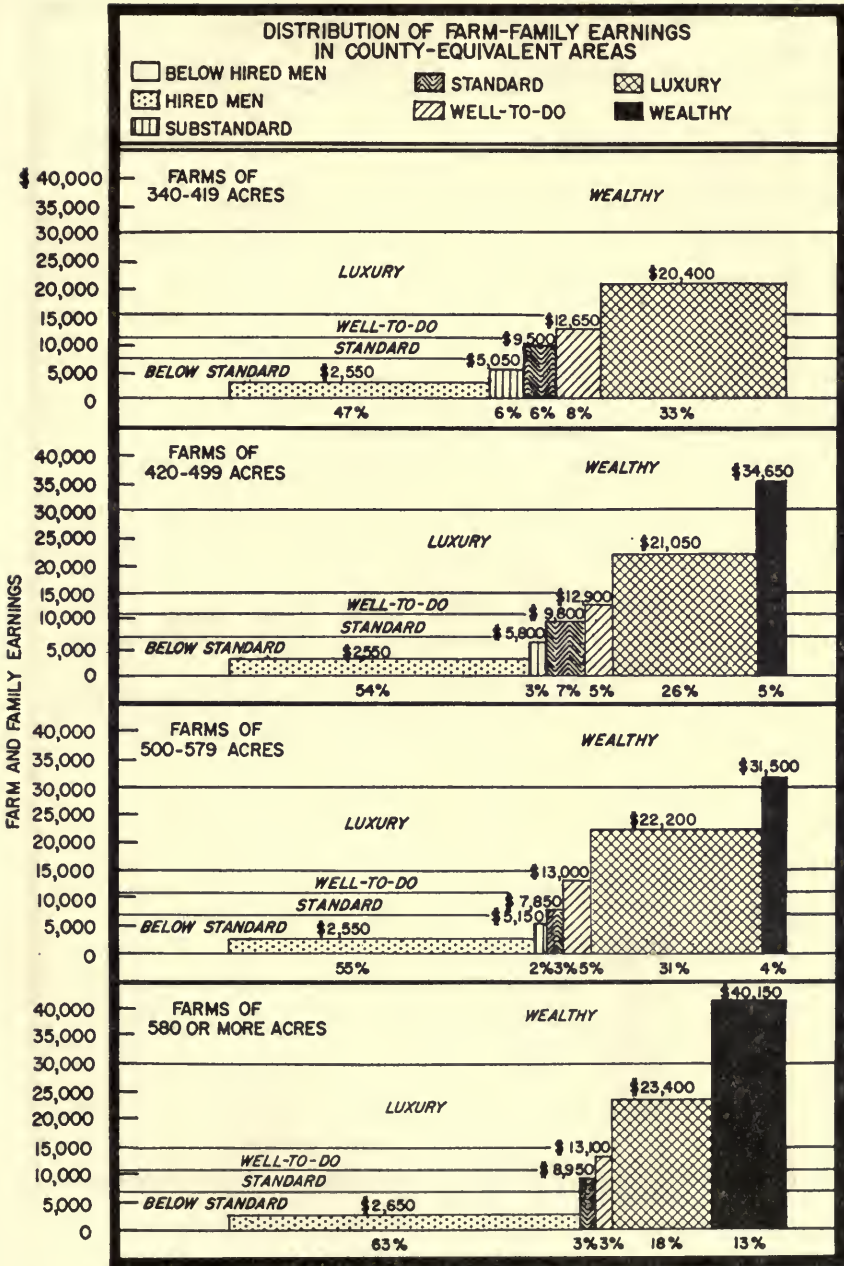
When data for five different periods were calculated for county-equivalent areas, the same general trend appeared (Figures 21a and 21b and Table 8). In the charts four levels of earnings are considered: operators with below hired men's earnings and with substandard earnings in one group; operators with standard and well-to-do earnings;

Table 7.—Percent of Total Number of Farm Families in Each of Four Level-of-Earnings Classes, 1954 Study

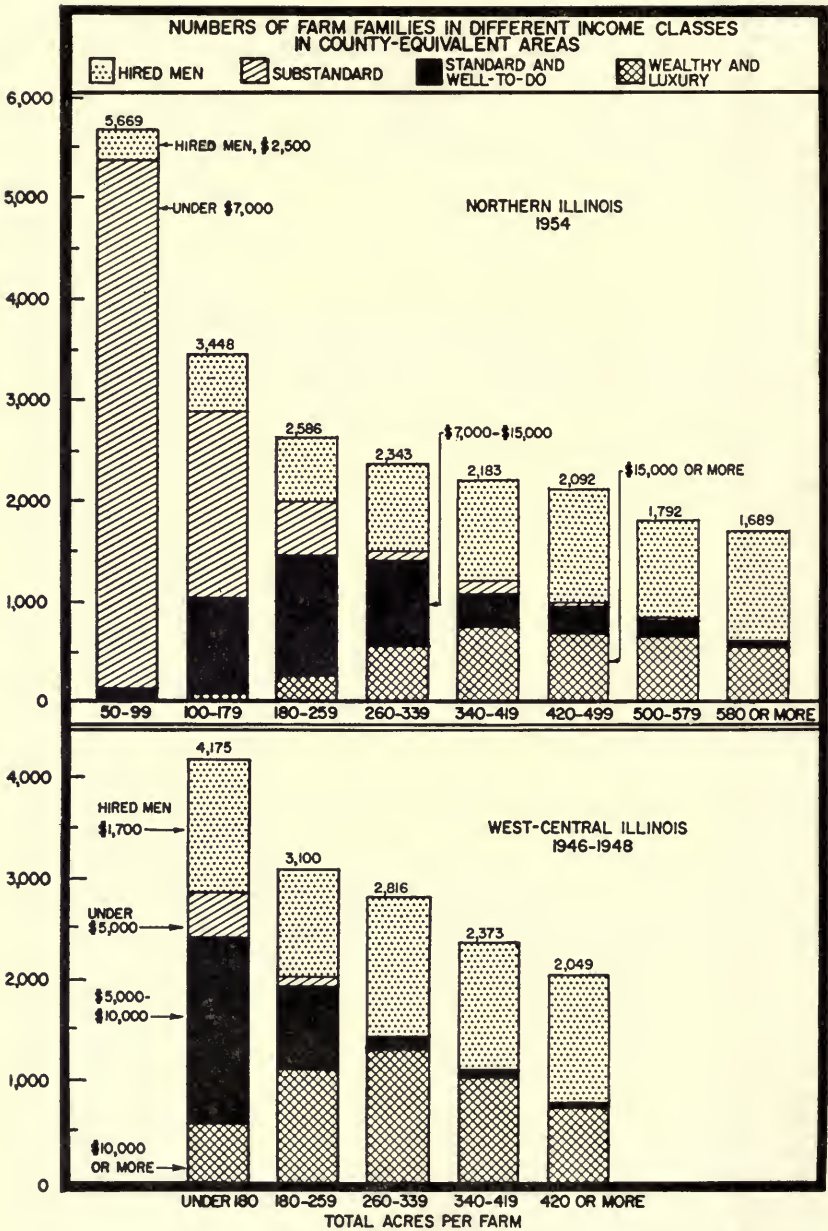
Level-of-earnings class	Size-groups of farms—total acres per farm							
	50 to 99	100 to 179	180 to 259	260 to 339	340 to 419	420 to 499	500 to 579	580 or more
Hired men.....	5	16	23	37	47	54	55	63
Substandard.....	93	54	22	5	6	3	2	0
Standard.....	2	28	46	37	14	12	8	6
Wealthy.....	0	2	9	21	33	31	35	31



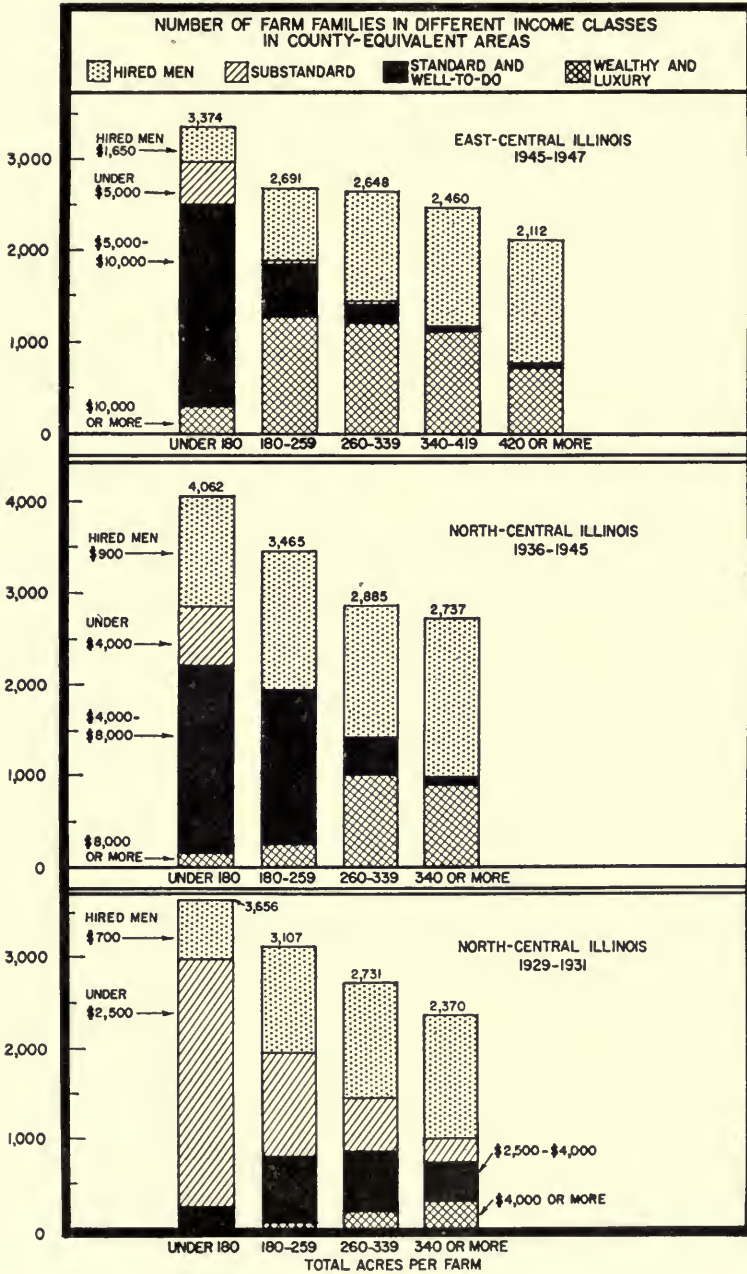
(FIGURE 20a)



(FIGURE 20b)



(FIGURE 21a)



(FIGURE 21b)

those with luxury and wealthy earnings; and hired men. The money value assigned to each group is varied as necessary for the different periods.

The largest number of farm families in the standard and well-to-do classes was found in the 180- to 259-acre area in the 1954 and 1929-1931 studies, and in the 100- to 179-acre area in the other three studies (Figures 21a and 21b).

Table 8. — Earnings of Four Classes of Farm Families During Five Periods

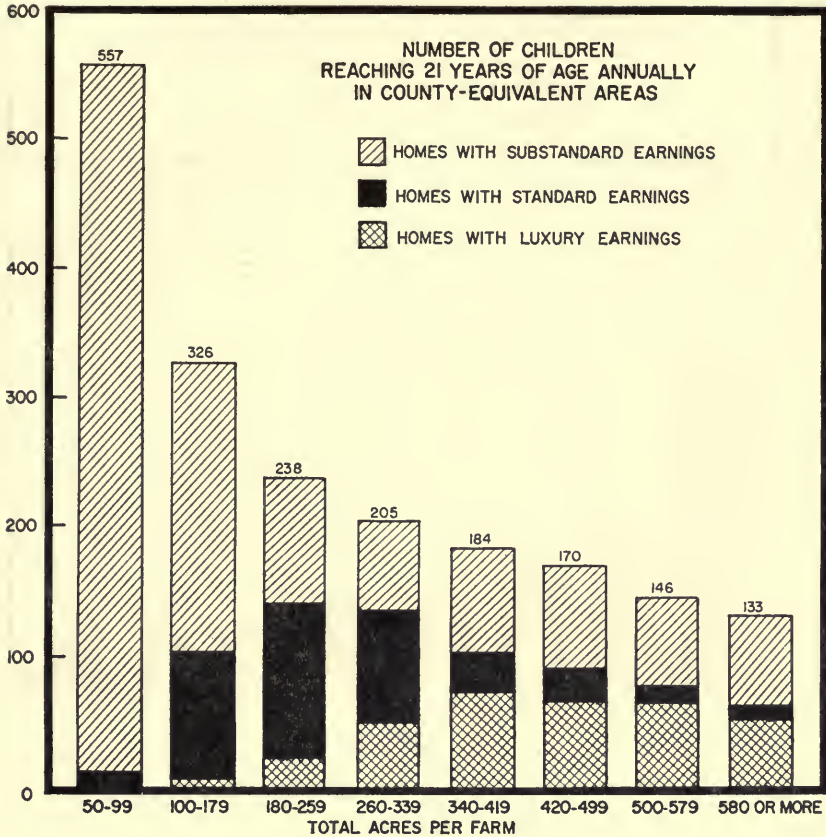
Class of farm families	1954	1946-1948	1945-1947	1936-1945	1929-1931
Hired men	\$2,500	\$1,700	\$1,650	\$900	\$700
Operators with sub-standard earnings..	Under \$7,000	Under \$5,000	Under \$5,000	Under \$4,000	Under \$2,500
Operators with standard earnings ^a .	\$7,000 to \$15,000	\$5,000 to \$10,000	\$5,000 to \$10,000	\$4,000 to \$8,000	\$2,500 to \$4,000
Operators with luxury earnings	\$15,000 or more	\$10,000 or more	\$10,000 or more	\$8,000 or more	\$4,000 or more

^a Standard earnings during the two earlier periods were considered sufficient to enable the farm family with three children to live in a modern home of those times, give college educations to part of their children, and save enough for retirement.

It is apparent that except in the depression years farm families tend to fall into two distinct level-of-earnings classes in the hypothetical county-equivalent areas of farms of 340 or more acres. One class consists of the hired men, who form 50 to 60 percent or more of the farm population; the other class consists of operators' families with incomes that provide comparative luxury and wealth. The so-called middle-class farm family tends to disappear in an area of corn-belt farms of more than 400 acres of good corn land.

Number of Children Reaching 21 Years of Age

More children in middle-class families (that is, families with standard and well-to-do earnings) reach the age of 21 annually in the county-equivalent area of farms of 180 to 259 acres than in any other area (Figure 22). Next in number of children from middle-class families was the area of farms of 100 to 179 acres, and close behind was the area of farms of 260 to 339 acres. On farms of more than 340 acres, children fell into two distinct classes: those raised in homes with sub-standard earnings and those raised in homes where earnings were high enough to enable them to live in luxury and wealth, if the earnings were not diverted to the accumulation of more wealth.

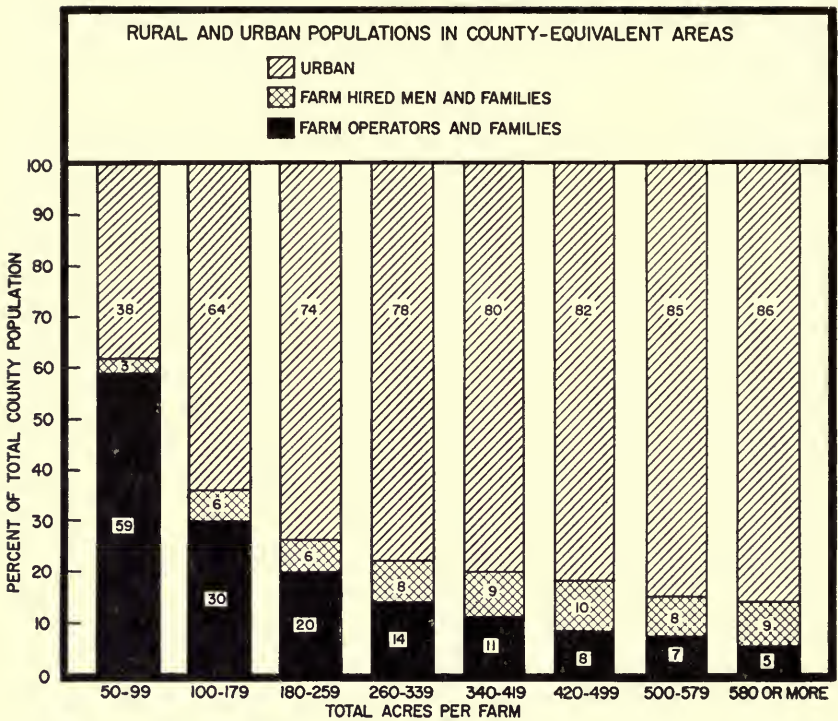


(FIGURE 22)

The smallest numbers of children in middle-class families were in the area of smallest farms and the two areas of largest farms.

Farm and Nonfarm Populations

The typical 20-township county in the northern half of Illinois, without a large city like Peoria or Rockford, would have a total population of about 50,000 people. Assuming that the total population would remain the same regardless of the division between farm and nonfarm population, the division for the different county-equivalent areas would be as shown in Figure 23. The division would vary from 62 percent farm and 38 percent nonfarm in the area of smallest farms to 14 percent farm and 86 percent nonfarm in the area of largest farms.



(FIGURE 23)

For the county-equivalent areas of small farms, the assumption that the population would remain the same may not be realistic because industry would come in to use the surplus labor on the small farms. This would not be as likely to happen in areas of farms of 180 or more acres, which could be organized to use all family labor profitably.

Hired Men and Operators

In the county-equivalent areas of farms of 420 or more acres, more than half of the farm families are hired men’s families. In the areas of farms of less than 260 acres, less than one-fourth of the farm families are hired men’s families.

The percentage of farm families who are operator families varies from 95 in the county of smallest farms, to 63 percent in the area of farms of 260 to 339 acres, to 37 percent in the area of largest farms.

THE DESIRABLE SIZE OF CORN-BELT FARMS¹

If northern Illinois farms continue to grow larger at the accelerated rate of the past thirty years, commercial farms of less than 100 acres on which there is no outside income will be absorbed into larger farms with the passing of this generation of farmers. With the passing of a second or third generation, farms of less than 260 acres will all but disappear.

The number of part-time and residential farms is now increasing rapidly. According to the 1954 Census, 35 percent of all farms in the United States were part-time, residential, or subsistence farms. They contained, however, only 10 percent of the farm land, and only 2 percent of all market sales came from such farms. It is the author's opinion that such farms will continue to increase in number, will become smaller, and will continue to have little effect on total market sales.²

The author does not prophesy that the change in size of farms will follow exactly this pattern. He believes, however, that if the present attitudes toward land tenure, taxation, zoning laws, and national planning continue and if individuals are more interested in accumulating land and other wealth than in developing a better community life, the trend will be somewhat as stated.

Is this trend desirable from the standpoint of the national welfare and the welfare of the people who live on the land, including hired workers? In the author's opinion, it is not all desirable.

The most desirable size of corn-belt farms might be described as the size that will accomplish the following:

- (1) provide for the optimum use of land, labor, and capital;
- (2) permit continuity of family ownership and operation of farms from generation to generation;
- (3) allow for the largest number of middle-class families to live on and receive their income from the land;
- (4) provide the largest community base of income expendable for family living and community development; and

¹ The author accepts responsibility for the statements and implications in this section. He bases his opinions not only on the study reported here and similar studies but on experiences and observations during fifty years of agricultural extension and research work in Illinois and Iowa and on observations made as he traveled in every state of the Union, noting and photographing the living conditions of farm people.

² See "Family Farms in a Changing Economy," U. S. Dept. Agr. Inf. Bul. 171. 1957.

(5) permit local political decisions to be made by the farm owners and operators who pay most of the taxes.

Owner-operated farms of 160 to 240 acres and tenant-operated farms of 240 to 320 acres of good-cornland grain and livestock farms meet all these requirements. Well-operated poultry, fruit, and vegetable farms of 80 acres or even less of good land may qualify. On less-productive land, larger farms are, of course, required.

The optimum use of land, labor, and capital was found on farms of 260 to 339 acres in the northern Illinois studies for 1954 (page 13). The net earnings per acre, per \$100 invested, and per man were smaller for farms under 260 acres and were no larger for farms of 340 or more acres. The optimum size has increased by about 60 acres since 1916, when farm records were first available in the area. There will probably be further increase in the size of farms that will provide for the optimum use of land, labor, and capital.

The two-man size of farm business is desirable, since it provides for the continuity of family ownership of farms or for continuity of operation of rented farms. Such continuity of ownership and operation within the family is much more likely to follow on farms large enough to occupy the time and managerial abilities of two men than on smaller farms.

Children who grow up on farms too small to occupy the time and energies of two men and to support two families will ordinarily leave the farm and become established elsewhere ten to twenty years before their parents are ready to retire. If the farm business is large enough, however, to utilize the efforts of two men, some type of father-son agreement may be developed which will enable both father and son to be occupied. (The "son" in a father-son combination may be a son, son-in-law, nephew, young brother, or some other young man in whom the owner is interested.)

This concept of the continuity of ownership and operation of a two-man farm by use of the father-son agreement helps solve one of the most perplexing problems of present-day agriculture: the high cost of land and large operating capital needed, which makes it almost impossible for many worthy young people to get started in farming. Working under such an agreement, a young couple can gradually take over ownership of operating capital and land as their earnings increase and the parents' labor earnings decrease. They in turn can pass the farm and business on to their children.

The size in acres of two-man farms varies greatly with the type of

farming, quality of land, and managerial abilities of the operators. The fifty Illinois farms of 260 to 339 acres used in this study, which size provided for the optimum use of land, labor, and capital, were essentially two-man farms. They used an average of 20.5 months of labor per year. They were hog-grain-beef-cattle farms with 49 percent of returns from hogs, 26 percent from grain, 16 percent from cattle, and only 9 percent from dairy, poultry, sheep, and miscellaneous income.

The author defines a two-man farm as one that requires from 18 to 30 months of labor when used with average efficiency. On that basis two-man farms in this study varied from an 85-acre dairy and poultry farm to a 670-acre grain farm that produced a few hogs. The average size of two-man Woodford county farms (Figure 4, page 12) increased from about 200 acres to about 320 from 1916 to 1955. They will undoubtedly become larger as further efficiencies in crop and livestock production come into general use.

More families having earnings of \$7,000 to \$15,000 in 1954 were found in the county-equivalent area of farms of 180 to 259 acres than in any other size-of-farm area (Figure 22, page 37). Roger Babson, one of America's leading economists, wrote in a January, 1956, magazine article:

The future progress and security of this country depend on the children of the middle class. I often wish that parents would spend more time and money training their children and less on trying to accumulate more of an inheritance for them. Children do not need to inherit money so much as to have the attention of their parents while they are young.

Judged on this basis alone, farms of 180 to 259 acres were the most desirable of the eight sizes of farms studied. However, these farms have proved to use land, labor, and capital less efficiently than larger farms and as now organized do not provide enough work for two men and for continuity of ownership from generation to generation. Only 15.6 months of labor were used annually on the average of such farms. The efficiency of modern machines, however, is now being realized by the cooperative ownership and use of large and expensive machines by the operators of two or more such medium-sized farms. Those who object to the loss of independence by such cooperation may be putting the desire for their own independence ahead of the welfare of their families.

Farms of 100 to 179 acres measured up very well with those of 180 to 259 acres in regard to the number of middle-class families in the county-equivalent area of such farms; there were, however, nearly three substandard-income families to one middle-class family in the

area. They, too, could be made to fit into the desired two-man size of business by developing intensive livestock businesses. However, it is doubtful whether they could be operated as efficiently as the larger farms, even with cooperative ownership and use of large and expensive machines.

There were nearly as many middle-class families in the 260-339-acre area as in the 180-259-acre area, and less than half as many families, including hired men, with substandard earnings. Twenty-one percent of the farm families in the 260-339-acre area had luxury earnings. None had wealthy earnings.

There were relatively few middle-class families in all four hypothetical county areas of farms of 340 or more acres. Most families were either hired men's families with incomes of \$2,500 to \$3,000 or operators' families with earnings, before income taxes, of \$15,000 to \$60,000. Many families on farms with luxury earnings, however, live no better than those on farms of lower earnings because the earnings are used to buy more land.

If the trend in size of farms of the past thirty years continues, the great-grandchildren of the present generation will find themselves in a rural environment where a majority of the children grow up in hired men's homes and a minority in homes of luxury or wealth. This will tend to lead to definite class distinctions in the school, church, and social life of the community. Such a class cleavage was found in a California study of two nearby similar areas, one of small family farms and one of large commercial farms.¹

A county area of farms of 260 to 339 acres would have about a third more expendable income, after income taxes, for family living and community development than a county area of farms of 580 or more acres (Figure 19, page 30). In 1954 this would have been about \$4,000,000 more for the year. Even in a depression year, such as from 1929 to 1931, there would have been about \$1,000,000 more expendable income in an area of medium-sized farms than in an area of large farms. It is the author's opinion, based on observation and reports of research in other areas, that considerably more of the income of large-farm families than of the medium-farm families is spent outside the county in which the farms are located.

In the county area of farms of 260 to 339 acres, much more money would be available each year for home improvement, family develop-

¹ See "Small Business and the Community," by W. R. Goldschmidt. U. S. Printing Office, Washington. 1946.

ment, schools, churches, rural roads, and other community enterprises than in an area of smaller or larger farms. This is a major consideration for all who are interested in family development, community welfare, and national planning.

Some local decisions would be made by hired men, rural residents, and part-time farmers if northern Illinois commercial farms were 420 acres or more in size. This will happen if the present trend continues. In 1954, 54 to 63 percent of the farm people in the three hypothetical counties of 420 or more acres were hired men and their families (Table 7, page 31).

Henry C. Wallace's prophecy. On the Iowa State College campus is a monument to Henry C. Wallace, who was on the staff of the College for a time, was editor of *Wallace's Farmer* for about twenty-five years, and then was Secretary of Agriculture from 1921 until his death in 1924. The plaque reads:

As editor he worked for a richer and happier rural life; as Secretary of Agriculture, he provided an economic service for American farmers; as statesman, he led the vanguard in the battle for equality for Agriculture; as prophet, he saw in the fertile lands of the cornbelt the basis of a rural civilization finer than any the world has known: He died laboring to bring nearer the day of its coming.

If Wallace's vision of a "rural civilization finer than any the world has known" is to become a reality for our great-grandchildren, it is time that we give continued serious study to the size of farm that will be most desirable one hundred years from now. The decision made one hundred years ago to sell the public lands of the great midwest in 160-acre tracts has had profound influences on today's economic, social, and political life. Legislative and executive decisions of the next few years may have even more influence on conditions that will be found one hundred years from now.

Considering the five measures of desirability of size of farm—economy of operation, continuity of ownership from generation to generation, number of children reared in middle-class homes, community development, and political control of local agricultural matters—it appears from these studies that the two-man family farm is the most desirable.

Three roads appear. One road leads to the public subsidizing, in one way or another, the small or inefficiently operated farm. This would lead to farm populations of relatively poor people constantly clamoring for more help.

A second road leads to concentration of ownership or operation of farm land in the hands of a few people. The commendable desire of the American people to encourage individual initiative of those having superior managerial abilities, the fact that increasing efficiencies require more concentration of capital, and the bargaining power that such owners and operators would have, all make this road very attractive to many agricultural leaders and some political leaders who are themselves men of that ability and opportunity. Although slow, there is a definite movement in this direction, especially in specialty crop areas, which may lead to an undesirable situation one or two centuries from now.

The third road, leading to the division of farm lands into family-size units large enough to insure a good level of living to all but the least efficient and not so large as to cause wide class distinctions, is a difficult one to follow. It is a splendid challenge to the agricultural and political leaders of this generation.

It is the author's belief that Henry C. Wallace's prophecy can best become a reality if this middle road is followed. It is not the purpose of this publication to suggest how this can be done. The purpose is as stated in the beginning to "stimulate the thinking of those responsible for farm and home planning, for community development, and for national policies on the subject."



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